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# The American Botanist

Devoted to Economic and Ecological Botany.

EDITED BY WILLARD N. CLUTE.

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# THE AMERICAN BOTANIST.

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## BARK.

BY PROF. W. W. BAILEY.

A TREE is known as well by its bark as by its general pose or the character of its foliage. The expert woodsman, who probably has no botanical knowledge whatever, will tell you, not only the generic but often the specific and varietal kind of tree. Thus, with the genus Quercus, he will say whether it is the white, the swamp white, the red or the post oak; or, in the case of hickory, whether one has shell-bark or pig-nut. The latter, however, is an easy case. Trees generally, stick to their uniform —but now and then, one is deceived. The chestnut and some other trees, wear different clothes in age from what they showed in youth. A young chestnut is quite a dandy, with a smooth pattern to his garments. The old fellow ceases to have his wrinkles ironed out.

We think of bark merely as the protecting envelope of the tree, but its structure is often complex and its functions various. It has, too, an individual and instructive history. At first it consists of a mass of cells hardly to be distinguished from the ground tissue, except that the cells, when exposed to light, turn green. This shows the presence of chlorophyll, and, indeed, at this time stems may function like leaves. But as the cambium at the growing season, produces wood within and bast without, a similar increase or growth takes place in the bark. To replace exfoliated parts—new tissue is formed or at least set apart as bark. The inner portion, next the wood, developes the so-called inner bark. Here one finds the bast cells, long and tough and flexible.

Next comes the cellular envelope or green layer, which,

in woody stems is soon cutinized, or covered with cork, a substance having the power of resisting entrance of water. It is this outer bark, which imparts to shrubs and trees their peculiar specific color, varying in the young state, from green or yellowish, to grey, brown, orange, or brilliant red. In late winter, the observer, as he passes along in the rapid flight of a railway train, will note that willow twigs are becoming golden, and the red maple beautifully ruddy. They are feeling the pulse of re-awakening life.

When this tissue takes an unusual development, as in cork oak, it forms the commercial cork applied to so many useful purposes. Indeed, it would seem, like rubber, absolutely indispensable to civilization. Cork also forms the beautiful, exfoliating layers of birch bark. Every visitor to the White Mountains or the Adirondacks knows how these successive layers may be peeled off till one comes to a beautiful olive green surface beyond which it is not safe to go. Indeed, the peeling as practiced, is in time ruinous to the tree.

Says Goodale, "Each yearly addition to the inner surface of the bark is seldom plainly distinguishable from those which have preceded it, and hence we cannot determine positively the age of an old tree by the layers of its inner bark. The bast fibres of a single year often cling together in a striking manner, forming bands or strips of considerable length, and in a few cases, notably that of *Daphne Lagetta*, there are fine meshes between the fibres, so that the inner bark seems to be composed of delicate fibres." This is the familiar lace bark of museums.

Among the functions of cork is to heal the smaller wounds of plants. Originally smooth, the bark in time becomes furrowed or wrinkled by the expansion of the tree, and this in a peculiar way for each kind of tree. How different is the surface of the ash, say, from that of maple or elm, or any of these from each other! We may remark in a general way, that the bark breaks into those distinctive patterns as the result of continual expansion,

but while there may be a common underlying law, it is certainly variously played upon. There would appear to be an individual tendency in each sort of tree.

This matter has been closely studied by the late Thos. Meehan, of Germantown, who with his usual independence, took issue with certain accepted statements. It is a matter too deep for discussion here. Mr. Meehan's pamphlet, which is well worth perusal, is Bulletin No. 29 of the Department of Agriculture of Pennsylvania, and is illustrated by figures.

The bark of a tree is a complete microcosm, where many creatures live, move, and have their being. Every one has observed how upon a wet day, the north or northeast sides of trees, more especially, are clothed with vivid green. If we scrape off some of this granular or slimy matter and examine it under a compound microscope, we will find it to consist of a complex mass of several kinds of low vegetation. Indeed, upon bark may be seen algae, fungi, liverworts, mosses and lichens. While some of these are found on any tree, others are confined to certain sorts. Such is especially the case, we have found, with mosses. These are very coquettish as to habitat.

The vegetable covering, of varying colors, from intense green to yellow or orange, add very much to the beauty and attractiveness of a tree. Lichens, indeed, sometimes form long, hoary beards upon the trees, till they resemble, "Harpers hoar with beards asleep on their bosoms." One often finds a tree, like the beech, scored with circular patterns, intricate and pretty. Great spreading fungi, forming elaborate brackets, will be seen on some forest trees, occasionally tier above tier. These are indicative of disease, but are the effect rather than the cause. If fungi appear on a tree, it is pretty safe to consider it doomed as the delicate threads of mycelium are then wide spread beneath the bark, permeating the vital tissues. If the trees are ones own, they should be guarded against wound or abrasion. City trees are in parlous state. Indeed, there should be formed a Society for Pre-

vention of Cruelty to Plants. The writer will gladly be a lay member and can talk in meeting.

Besides the cryptogamic life above mentioned as coincident with bark, under this if it is detachable, will be discovered a varied and multitudinous animal existence. Some of these creatures are predatory and distructive; others, merely make the tree a temporary home. At this season (December) certain moths (red underwings) or butterflies (*Vanessa Antiopa*), like to escape approaching cold, and creep under exfoliating bark to hibernate. Many a nice specimen have we in old entomological days—red-letter days—thus secured.

*Providence, R. I.*

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## CEREUS GIGANTEUS.

BY ALBERTA A. FIELD.

The first time that I ever saw these gigantic cacti, called by the Mexicans, Sahuras (pronounced sa-wah-vah,) in the moonlight, I certainly mistook them for a band of express robbers standing in wait to hold up the passengers of our great, yellow-bodied stage coach, which was theading its way through one of the lonely canons of the lower Pinal range in Gila County, Arizona, so boldly did they out-line against the shadowy rocks, it being the hour and place when and where these gentlemen of the road frequently met to operate their special line of business. But we passed unharmed and unmolested among these tall, many-armed sentinels of the foothills, with never an attempt on their part to disturb our journeyings. My nervousness began to abate somewhat, and I was able to more carefully observe the strange make-up of these truly wonderful sand-hill growths, which look more than anything else like gigantic candelabrums made to adorn the feast table of some mighty monarch of the mountains.

In reality, these cacti are of very frail nature, being literally nothing but thin strips of woody growth in cylindrical form, covered and bound together by an outside

skin or fiber of pale green color and fluted like a Corinthian column. The edges are covered with wicked spines, and the whole is a growth largely composed of water, in a land where that liquid in an almost unknown quantity. The root-hold is absurdly inadequate to the mammoth bulk which it is intended to support, and in which the elements of decay are at work ere it has fairly begun its growth. Many and many a giant falls down the canon side a victim to an insecure foundation and early decay, though it has literally followed the Scriptural advice to build upon a rock. Their foot-hold is such that it seems impossible for them to derive any material sustenance from it, so their nutriment must be largely atmospheric.

Out of all proportion indeed, are the small, yellowish-white blossoms which grow in clusters at the terminals of the branches. They have all the characteristics of the ordinary cactus bloom, but one does not gather them for a nosegay for pertinent reasons. They are carefully protected by innumerable thorns, ferociously in evidence at all times, and which entirely cover the rich, crimson fruit. This is about the size of a small egg and develops in about three months from the flower. The Indians gather it with a sharp, pointed stick, rubbing off the fine thorns with a woolen rag, and find a ready sale for it in its season. The first ripe fruit that I saw, I was greatly interested in, and eagerly gathered it with my gloved hands but it was quickly dropped into my lap, for the tiny, needle-like prickers penetrated my gloves, entirely ruining them, and from thence sought their way into my fingers producing painful sores. The front of my riding habit was filled with the tiny bristles, and could only be worn after a long and tedious search for them. But this trial by thorns is only one of the many vicissitudes to which the tenderfoot is subjected when fresh from the country "back east."

The fruit of this desert tree is really very palatable when denuded of its spiny covering, tasting something like a ripe fig, but sweeter and richer in flavor. When I be-

came initiated in the customs of the country I used to ride my horse to the extreme edge at the top of some canon, on the side of which grew these cacti, and whose tops were on a level with the summit, where I was able, by the aid of one of the long cane-like ocotilla poles, to secure some of the finest fruit, which had perhaps an added flavor from the fact of the dangerous position assumed, where an overbalancing movement, a bit of loose rock or a miss-step on the part of the horse would send us both crashing down the side of the steep canon to the river below, and to eternity.

One large Sahuara that we saw had been preempted by a pair of crow-ravens who had built among the uppermost arms, thereby securing for themselves and their offspring, a safe and secluded shelter. These cacti are also frequently utilized by the woodpeckers who find in their soft, pithy substance, easy carpentering and safety from the numerous snakes that are a great source of annoyance and danger to the bird world in this section. The many spines on the column-like growth prove a formidable barrier against reptiles, as well as other marauders.

*Ashtubula, Ohio.*

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## PARTRIDGE BERRIES AND WINTERGREEN BERRIES

BY WM. A. TERRY.

In regard to the time of ripening of wintergreen (*Gaultheria procumbens*) and partridge berries (*Mitchella repens*) my experience has been that they vary considerably according to location and the season, but that here in Connecticut the wintergreen may be said to ripen in August and the partridge berry a little later. That is, they take on their bright scarlet color, and have the flavor of maturity, but they have by no means completed their growth. They continue to increase in size during the autumn and also more or less through the winter, and particularly in the following spring.

This year, on the fifth of July, I was hunting for plants

of the painted trillium (*Trillium undulatum*) on the north slope of Johnny Cake Mountain in Burlington. I found them with berries nearly full grown, but not yet beginning to change color. By the way, a compact bed of the painted trillium in fruit, each with its bright scarlet conical berry held upright three or four inches above the foliage, is as interesting and nearly as beautiful a sight as the same plant in flower. In searching through the dense bushes for the trilliums, I found a compact bed of wintergreen extending from the deep shade out into more open space. They were heavily fruited, each plant having from four to eight berries. On the shaded side of the bed I found a few plants in flower, and on the sunny side there were plants with berries beginning to turn red on one side. I have often picked considerable quantities of wintergreen berries in June, in fact, in gathering the young and tender shoots in early June, we nearly always find numerous last year's berries in perfect condition.

In July, 1900, we were hunting for the whorled pogonia (*P. verticillata*) and found them with seed pods nearly full grown. In an adjoining lot were quantities of wintergreen, many of them loaded with fruit, mostly very large and in perfect condition. In all these cases a small proportion of the berries will not be much larger than they were in the fall, while others will be sometimes enormously swollen. As to the partridge berry we have no difficulty in finding quantities of them ripe early in September. Several years ago my wife took a bunch of the tips of the vines, containing the beautiful and fragrant little twin flowers, and put them in a tumbler of water which she placed in a window. They remained there through the summer, perfecting and ripening their berries, which remained in good order through the autumn and the following winter until spring, when, the foliage having become discolored, she threw them away. For several years she has taken the tips of the vines containing the berries and planted them with mosses, etc., in various receptacles, where they would flourish through the winter,

the berries increasing rapidly in size, until in spring they were several times larger than they were when gathered in September.

The dark green leaves and bright scarlet berries make as beautiful an ornament for the window garden as could be desired. Last spring she took one of the vines which held a large berry and placed it in a wire basket of ferns, etc., which was hanging on the veranda. This fall, on the approaching of frost, the basket was hung before a window in the cellar, and now, at this writing, December 3, 1902, the berry still hangs from the basket, as plump and brilliant in color as in the days of its youth, having lived through two seasons of growth, and well on into the second winter.

*Bristol, Connecticut.*

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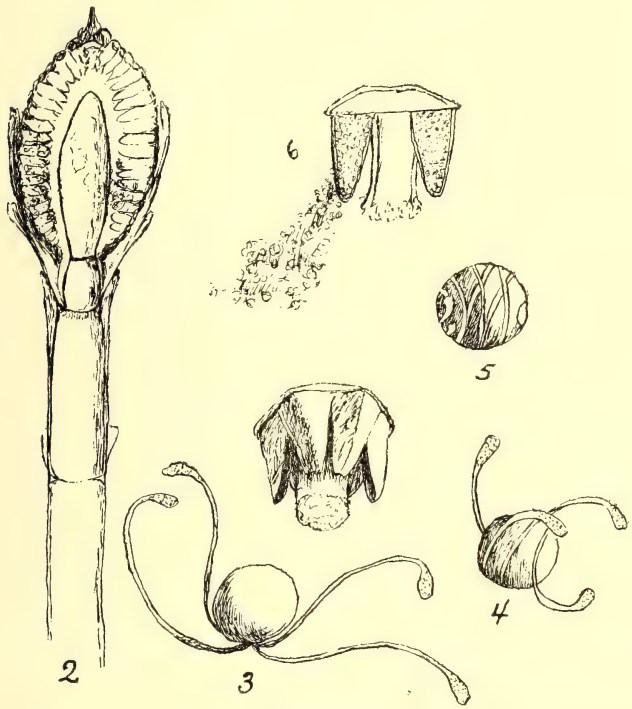
## THE SCOURING RUSH IN WINTER.

BY WILLARD N. CLUTE.

The books on the fern allies agree that the common scouring-rush (*Equisetum hyemale*) fruits in summer, but the statement needs qualifying. While there is undoubtedly an increase in the number of fruiting cones about the middle of June, in this latitude, it is also true that fruit may be found at almost any time of the year. June may be called the fruiting season; it is then that the cones lengthen until each of the six sided plates composing its exterior are drawn apart to enable the spores to escape and allowing us to see that the plates are merely the tops of the six celled sporophylls. But June is not the only season at which ripe spores occur; the compact little heads that are found on the plants in winter (fig. 1.) have fully formed spores snugly packed away until a warmer season.

If one will split some of these winter cones from tip to base with a sharp knife (fig. 2) and

quickly examine the cut surfaces with a simple magnifier he will see a most interesting sight. From the gaps made by the knife in the delicate walls of the sporophylls, a lively crowd of spores come tumbling out (fig. 6) jostling each other in their haste and apparently urged on by those behind. As each fat little spore reaches the open, it unfolds its elaters, like four tiny wings, (figs. 3 and 4) and quickly sails out of the field.




As long as the moisture in the tissues is evaporating, they continue to come. To change the scene one has only to dip his specimen into water At once every elater is coiled (fig. 5). Even those spores just balancing on tiptoe as it were, for flight, decide to remain and all seem trying to shrink into the smallest compass possible. We are taught that the elaters function is in assisting the spores to escape from the sporangia, but it appears that they are

quite as useful as parachutes when the spores sail down the wind looking for new territory to conquer. Moreover, their hygroscopic character ensures that the spores shall not set out on their travels until a fair day comes and the sailing is good and that the elaters will not be folded again and the spore dropped until a moist interval, suitable to germination, occurs.

## ORNAMENTAL SEEDS.

The tropics produce many curious seeds and nuts, not a few of which are used as ornaments by the natives. The *Journal of the Society of Arts* believes that some of them would be worthy of more extended use, and mentions their characteristics as follows:

Horse-eye beans are the seeds of species of *Mucuna*, chiefly those of *M. urens*, and they get their common name from the fact of their appearance being similar to that of the eye of a horse, though somewhat smaller. They are the produce of climbing plants of the tropics, belonging to the order Leguminosæ, and are well known to travellers, in consequence of the pods in which the seeds are contained being thickly clothed with sharp, stinging hairs, which are readily detached by the slightest shake. A familiar illustration of the annoyance caused by these hairs penetrating the skin is to be found in the allied species, *Mucuna pruriens*, which furnish the cowhage, or cowitch of pharmacy, at one time much used as a vermifuge. The horse-eye bean, when fully ripe, dries well and becomes quite hard. It has a brown, pitted, or rough surface, surrounded with a smooth, darker band. Divided in half, hollowed out; hinged and mounted with a gold or silver rim, these seeds make excellent appendages for watch-chains, or variously treated with similar mountings, they would form quite attractive bracelets.

Similar results might be obtained with nicker beans (*Casalpinia bonducella*). There are also the produce of a leguminous plant, two or three seeds being contained in

each pod, which is of a chocolate-brown colour, and studded with stiff woody spines. The seeds are about the size of a large Barcelona nut, irregularly globular, very hard, with a shiny surface, mostly of a greyish-slate colour, but sometimes yellow, orange nearly black, or even white. They are commonly used by the natives for making necklaces, bracelets, and rosaries. In India, where the plant is common, the kernel of the seeds is said to possess medicinal properties. The smaller seeds of the nicker, properly mounted and provided with a shank, might well be made into waistcoat buttons or ornamental buttons for ladies' dresses, as was at one time done in England with the soap berry seed. These are the produce of *Sapindus saponaria*, a small tree, the fruits of which are fleshy and about the size of a cherry, containing one hard, intensely black seed. The pulpy portion of the fruit shrivels in drying and becomes horny; it contains a large proportion of saponin, which is readily extracted by soaking in water, and is thus much used by the people for washing fabrics, as a lather is very quickly produced. The hard, round seeds are used for making neck laces, bracelets, buttons, and rosaries, and it is said that many years ago buttons were made of them, and used in England, chiefly for waistcoats. The absence of any figure or colour in the seeds, being a dull uniform black, does not recommend them for general purposes, but with silver mounts they would be particularly suited for mourning use.

The intensely hard seeds of the Gru Gru palms, for the name is applied to at least two distinct West Indian palms, namely *Arocomia sclerocarpa* and *Astrocaryum vulgare* are like the soap berries, black. They grow, however, to the size of a walnut, and the centre being occupied with soft oily seeds, they can readily be hollowed in the form of boxes, or cut into buttons of different shapes and sizes, and as they take a fine polish should find some general application.

Amongst the brighter coloured seeds which should find a use amongst jewellers may be mentioned crabs eyes,

furnished by a common tropical climbing leguminous plant (*Abrus precatorius*). The seeds are abundantly produced in small pods, and are themselves quite small, of a bright scarlet colour, with a black spot. They are very uniform in size and weight, the average weight being 1.75 grains. Wherever the plant is grown these very ornamental seeds are used for necklaces, ear ornaments, and personal adornmens of all kinds, as well as for rosaries, and for decorating boxes, baskets, etc. Dr. Watt says the plant with its open withered fruits exposing the scarlet seeds is twisted round leafy boughs to simulate the holly at Christmas time at English stations in India. It may be worth while saying that the seeds in the fresh state contains a poisonous property which is dissipated by boiling.

A seed almost identical in appearance, namely a bright scarlet with a black blotch but much larger in size is that known as the Jumbi and produced by an allied leguminous plant, *Ormisa dasycarpa*. These seeds might well be used as a substitute for coral especially for necklaces and for mounting in brooches, as might also those of the coral tree (*Erythrina*) which are of coral red without the black spot. A still brighter seed also without the black mark is that furnished in India by *Adenanthera pavoniana*, a large leguminous tree of Bengal, South India, and Burma. It is generally known as the Andaman redwood tree but sometimes as red sandal wood, in consequence of its use as a dye in substitution for the true red sandal wood or red sanders wood. The seeds are nearly half an inch in diameter somewhat lens shaped, that is convex on both sides and of the brightest shining red. In India they are often strung and made into necklaces, bracelets and other articles of personal adornment. They are also used as weights in consequence of their uniformly weighing four grains. Their bright colour, hardness and uniform size caused them to attract the attention, a year or two ago, of a London West-end jeweller, who contemplated using them for brooches, pins, rings, etc.

That many of the seeds here enumerated, as well as others, are capable of extended utilization cannot be doubted. Job's tears, the seeds of *Coix lachryma*, are by no means uncommon in the windows of fancy jewellers, made up into chains and bracelets, and there is no reason why there should not be a much greater variety of vegetable curios to choose from. Even with the Job's tears, there are several varieties used in India that are still unknown in English commerce and are only seen on native dresses, being used by certain tribes on account of their ornamental character.

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## Note and Comment.

WANTED.—Short notes of interest to the general botanist are always in demand for this department. Our readers are invited to make this the place of publication for their botanical items.

AMERICAN BOTANICAL CLUB.—The first Annual Report of the American Botanical Club will soon be issued and will contain the Constitution and list of members in addition to the officer's reports.

AN EDIBLE TUBER OF SPRING.—According to C. F. Saunders in the *Philadelphia Record* the tubers of the spring beauty (*Claytonia*) are edible, having "a crisp pleasant taste suggesting chestnuts." The Indian is said to have made extensive use of it.

USE FOR THE NUT-GRASS.—In parts of America, the nut-grass (*Cyperus esculentus*) is a troublesome weed but the people of Florida have found use for it as a food for stock. According to the *Florida Agriculturist* it is better for "making pork," as the phrase is, than any other feed, corn not excepted, and in addition the hogs do their own harvesting by rooting out the tubers. In Florida the plant is usually called chufa or earth almonds.

One Way to Protect Plants.—*Nature Notes* tells of a successful method for protecting plants adopted by a man named Atkins. "A neighbor collector remarked to him that some of the less common plants of the neighborhood—bee orchids, I think—seemed to be suffering from the wholesale attacks of some new enemy, all their flowering shoots being nipped off. 'Oh,' said Atkins, 'I did that to prevent you, finding them.'"

A New Edible Tuber.—French tropical colonies have recently taken up the cultivation of a new edible tuber, the product of a species of coleus (*C. Coppini*). The tubers average about an inch and a half long and half an inch thick. In the countries where these tubers grow, the potato is said to run mostly to tops, and the new tubers, having much the taste of potatoes and being prepared in the same way, are proving valuable as a substitute.

Gray Memorial Botanical Chapter.—The officers elected by this chapter for 1903 are as follows: President, Chas. C. Plitt, Baltimore, Md.; General Secretary, George P. Ells, Norwalk, Conn.; Treasurer, Roscoe J. Webb, Garrettsville, Ohio; Members of Executive Council, J. Ford Sempers, Aiken, Md. and J. C. Buchheister, Griffins Corners, N. Y. Any student of botany is eligible to membership and further information may be had by addressing the officers. The studies are carried on entirely by correspondence.

The Wool on the Cinnamon Fern.—A correspondent asks "What do you suppose those little woolly tufts are for, at the base of each pinna of the cinnamon fern?" Any reply we can make to this must, as suggested, be entirely in the line of supposition but judging from other members of the *Osmunda* family we should be inclined to say that this wool is a remnant of that which clothed the young crosiers, or "fiddle-heads" in winter and spring. All the *Osmundas* are protected by a woolly covering during the winter. The royal fern (*O. regalis*) being the smoothest, early casts off its woolly coat in patches, exposing its glaucous stem. The interrupted fern (*O. Clay-*

*toniana*) is more heavily clad, but when it reaches maturity has lost all trace of its spring coat. The cinnamon fern (*O. cinnamonæ*) is woolliest of all and may even be identified by this characteristic before the fronds are spread. It seems probable that the tufts of wool at the base of mature pinnæ are simply the last remants of that which protected the fronds from the frost.

Information Wanted.—The Society for the Protection of Native Plants, is to be commended for the very practical turn its efforts are taking. Recently a committee has been appointed to attend to cases in which the extermination of certain species is threatened. Accurate information is desired regarding the causes operating to bring about such extermination, especially as to depredations on our plants for commercial purposes. All information of this kind should be addressed to the Chairman of the Committee, Nathaniel T. Kidder, 610 Sears Building, Boston, Mass.

Fruiting of the Autumn Crocus.—The Autumn Crocus (*Colchium*) is so named because, unlike other crocuses, it waits until the year is on the wane before blooming. There is then not time enough to ripen its seeds before winter, so the plant retains the fertilized embryos safe within its subterranean bulb until spring, when they are pushed up on the seed stalk to ripen. The leaves appear in spring but die before the flowers open, in this very much resembling those of the common leek (*Allium tricoccum*). The leek, however, ripens its seeds immediately after blooming.

Blue Hydrangeas.—Writers in the horticultural publications are making another attempt to ascertain what it is that causes the blossoms in some specimens of *Hydrangea hortensia* to take on a blue color instead of the normal shade of pink. Many theories about it have been formed, only to be proven erroneous. It was formerly thought that the blue color was due to some constituent of the soil and saltpeter, salt, iron, alum and ashes were in turn advanced as the necessary ingredient. Observa-

tion has shown, however, that no matter in what soil the plants grow, those in deep shade are the ones likeliest to turn blue and the lack of light is the theory now advanced for the change in color. Possibly this may have some bearing on the fact that the flowers of autumn when the light is not strong are principally of some shade of blue or violet.

JAPANESE FERN BALLS.—In the *Fern Bulletin* for October, Kiichi Miyake notes that ferns are rarely cultivated in pots in Japanese households, fern balls, made by twining the flexible rootstocks of certain species, taking their places. These balls are now becoming common in American conservatories, also. The plant from which they are made is *Davallia bullata*. It formerly abounded in the mountains of Japan but is not common there now because constantly sought for decorative purposes. A writer in the *Garden* asserts that *Davallia Mariesi* is also used for these fern balls. It has slenderer rhizomes with silvery white scales changing to gray. Both species make good pot plants and are easily raised from spores.

COLOR AND EVOLUTION.—In the present age no one will seriously deny that evolution has played an important part in the development of plant and animal life; but when we try to interpret every feature as the direct outcome of the struggle for existence, we are probably far from the truth. We assume that fruits have attractive colors and pleasing flavors in order that birds and other animals will carry them off for food, and so disseminate the seed; but the rule has many exceptions. What animal eats the berries of the winter-berry (*Ilex verticillata*) except under stress of hunger, or those of the bittersweet? And yet our winter fields and swamps show no colors more brilliant than are worn by these fruits. Where are the animals that developed these colors from among the primitive berries of a more sober hue? And what palate assisted in the evolution of the winter-berry's nauseous taste? Or that of the spice-wood? The berries of the twisted stalk (*Streptopus roseus*) hang on the stalks un-

gathered and finally drop to the earth below. It would seem, that many colors are merely of secondary consequence. Otherwise, why is a beet root red and that of the carrot orange and yellow? The sap of most plants is colorless. Why was white sap necessary to the poppy's evolution, or orange-colored sap to the celandine's, or red sap to the bloodroot's?

GUM ARABIC.—This gum, best known for its use as mucilage, is the product of various species of Acacia. There is considerable difference in the color and adhesiveness of the gum from different species, that from *Acacia Arabica* being considered the best.

USES FOR WHITE BIRCH TIMBER.—According to *Forestry and Irrigation* more than thirty-five million feet of white birch timber are annually taken from forests in the State of Maine. This is used principally in making hardwood novelties and in the manufacture of spools. Of the latter, about eight hundred million are turned out each year.

A BAT TRAP.—*Country Life in America* for January gives a photograph of a little red bat that had been caught by the common burdock, and mentions other instances in which this animal has fallen victim to the plant. In one case the bat was found on the ground beneath the plant, still alive but so covered with burs that it could hardly move.

GERMINATION OF POLLEN GRAINS.—Pollen grains, it is said, may be artificially germinated in water, or in water to which a little sugar has been added. A French scientist who has been experimenting in this line asserts that some pollen grains that do not readily germinate in water may be easily induced to do so by adding to the water the stigmas of the same or allied plants; from which he draws the inference that there must be in the stigma certain substances that induce germination of pollen from the same species and prevent it in foreign pollen.

# Editorial.

The eyes of the practical printers among our readers will at once be caught by the change in the typography of this magazine, and all will doubtless perceive, that there has been considerable improvement in other ways—better paper, better ink and a better cover. As the end of Volume III approached, it became a question whether we should again add more pages or improve upon the appearance of the usual number. In deciding for the latter we shall doubtless have the approval of every reader accustomed to consider quality as well as quantity, while those who are anxious for a larger magazine will be interested in hearing that our next move will be for more pages. In fact, in so far as the amount of reading matter is concerned, the present volume is really enlarged; for past volumes were set in the style of type known as eleven point while the present one will be set in ten point, giving a larger number of words to the page. The type from which this volume will be printed was purchased expressly for this purpose, and the paper was selected as the one most suitable for our purpose to be found in the market.

* * *

We feel that we cannot too frequently emphasize the fact that this is a thirty-two page monthly. If past issues have only contained twenty pages it simply indicates that it has not got its full growth yet! Indeed, we are not certain that it will reach maturity at merely thirty-two pages, but its further growth depends altogether upon the kind of support it receives. At present we have no cause for complaint. During the past thirty days our increase of new subscribers has been nearly ten times greater than during any similar period, not omitting the rush times shortly after the magazine was established.

To the large number of new readers to which this issue of THE AMERICAN BOTANIST goes, we would say a few words. In the best sense, this is your journal and we shall endeavor to make it exactly as you want it. If it does not contain the kind of articles you like, write and tell us what you prefer and we will attend to the matter or, better yet, write a similar article yourself. It will be your own fault if we fail to please. Since it is not our wish to cater to the dry-as-dust sort of scientist, we confess a distrust for the technical article, the species-describing article and the categorical article, and acknowledge a liking for those attractive reports of original observations, individual opinions, curious experiences and personal experiments. We want the scientific names, to be sure, but we also want the common names when there are any. And above all we would urge you to remember the department of Note and Comment. An observant plant lover can scarcely take a walk in the fields without seeing something worth noting, but often such things are too trivial for a long article and so they remain merely as interesting remembrances in the observer's mind. We want all these notes. If you look through the back numbers of this magazine, you will be surprised to find how often some small note or query has called forth many other valuable and interesting observations.

* * *

A large number of sample copies of this issue have been sent to those who ought to be on our subscription list and we respectfully invite them to consider the matter. We would point out that not a line in the magazine is printed as "filler." Everything is selected for its use to those interested in plants. Taking it for granted that you already know the plants, we are endeavoring to provide further information about them—information that is at once useful, instructive and entertaining. This feature operates to make back numbers always of interest. Without impropriety each might be

called a botanical compendium of the period during which it was published. Of these back volumes, there are now less than two hundred sets remaining. It is therefore certain that when it comes to complete files somebody is going to get left. Don't be one of the number. The magazine is still so young that you can afford to begin at the beginning. Let others pay advanced prices for the early numbers when they want to complete their files.

* * *

New subscribers are requested to remember, that this jounral is not issued until after the middle of each month in order that we may review the other scientific journals, most of which are published earlier. Some of our delays in past numbers, however, have been due to the printers and having now made a change in this department we expect the magazine to be issued on time in the future.

* * *

In the days when the 6th Edition of Gray's Manual was printed, there were supposed to be about fifteen species of hawthorn (*Cratægus*) in Eastern America. Now there are said to be several hundred. We do not know the exact number, having lost count somewhere in the third hundred. Since there is a slight suspicion that these "new species" may, after all, be only individuals, we respectfully suggest that in order to avoid synonomy, each worker in this genus be provided with a set of neat brass plates one of which should be fastened to each tree as named. This would not only avoid synonomy; it would save time as well. How discouraging it must be to wait a whole year for a shrub to blossom in the hope that it may have nile green anthers and therefore be new, only to find when the flowers open, that its anthers were navy blue, turkey red, or some other color that had already been registered!

# THE AMERICAN BOTANIST.

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## PRACTICAL PLANT PROTECTION.

BY WILLARD N. CLUTE.

IT is to be expected that a movement founded so largely upon sentiment as that for the protection of our native flora, should at its beginning call forth many impracticable propositions for its advancement; but while sentiment may be well enough in originating the movement, it is certain that the sooner we face the facts in dealing with the problems presented, the sooner something definite will be achieved. It is well, at the outset, to find out what can not, as well as what can be accomplished and to act accordingly.

Societies for the protection of the plants can do much good, but it is an error to assume that if the Audubon Society can save the birds, another society, working on similar lines can perform the same service for the flowers. The cases are entirely different. Birds, being able to move from place to place, may well be considered the property of the public; plants being fixed in the soil must necessarily be sold with the land. There is little need to destroy the birds, for they are seldom in man's way; plants, on the other hand frequently exist where they are not wanted and their destruction is inevitable. Among the plants which are thus destroyed, there are often as many fair flowers as noxious weeds, but no law can protect them—they must die.

As yet, comparatively few of our wild-flowers are in any great need of protection, and those that are, are mostly species of limited distribution like the sea pink (*Sabbatia*) or the objects of special search like certain orchids and

the fringed gentian. I grant that in the environs of city and town, the native flora is fast disappearing but this, again, is inevitable. The only feasible way in which remnants of it may be preserved is by establishing small parks where all flower-gathering is forbidden.

To my mind, the attempt to foster a sentiment against the picking of any and all wild-flowers is not to be commended. Who that has still a remembrance of the pleasure derived from gathering flowers in childhood, would withhold the same pleasures from others? But there is a more practical reason for this stand. So long as the owners of woods and fields permit indiscriminate flower gathering, to refrain from picking the flowers you desire, is simply to leave them for others less considerate. This sounds like a selfish doctrine, but it is founded upon facts. Moreover, a vast number of attractive flowers, such as buttercups, toad-flax, violets, daisies, goldenrod and asters not only thrive without protection but often in spite of very decided attempts at their extermination. To teach children that flowers must not be picked is to give them wrong ideas of nature. All the rest of the world lives upon the plants. Every plant lover, however, is a plant protector and children possessing a proper knowledge of plant life know well enough what to pick and what to leave. Teach them the proper kind of botany and your choice wildings will not suffer at their hands. This, in the end amounts to fostering a sentiment against picking, but it is a feeling founded upon knowledge, not a false notion of the "sanctity" of plant life.

Sentiment is frequently wasted over the cutting of Christmas trees and the gathering of flowers for the markets. The land from which the trees come is usually too poor to grow anything else. If a man cannot raise wheat or corn, why deny him the right to his crop of Christmas trees? The flowers gathered for market, are gathered by permission, for the trespass laws are strong enough to prevent such gathering if the owner of the land cares to do so.

A resort to more laws for the protection of plants will

scarcely stop the destruction, for, as pointed out, a land owner may do with his plants as he likes; indeed, most of the land on this planet is now held by man for the plants it produces or will produce. The trouble is not in securing more laws, but in persuading land owners to enforce those now in existence. If the owner of a woodland would exchange a bunch of arbutus for silver, who shall prevent him? Until he is made to feel that the plant is of more real value than the money, the plants on his land will continue to be gathered.

For every flower picked for a bouquet, ten thousand are destroyed in the draining of swamps, the felling of woodlands, or the bringing of other wild land under cultivation. This cannot be helped and no time should be wasted in lamenting it. If such lands happen to be the home of rare species, an effort might be made to ensure their preservation, but persuasion not force must be used.

The foregoing has been presented, not to show that the cause of plant protection is hopeless, but to point out some lines along which efforts will be wasted. Recognizing the right of the individual to the plants upon the land he owns, and recognizing also, the fact that he must often destroy in his industrial operations the objects of our solicitude, let us see what we have left that can be protected. First there are the country roadsides. At present, country roads are in most parts annually "improved" by cutting down all the wild things along the way. It would be excellent to secure laws protecting these plants for certain distances from the property lines on both sides of the road, the enforcement of which might well be left in the hands of botanical clubs, municipal improvement societies, park boards and the like. There are also thousands of miles of sea-coast and river banks and lake shores which should belong to the public and might be made into parks of this kind and their plants carefully protected. There are also many acres of land that are now parks in which little protection is extended to the wild plants. Societies for the protection of plants could first secure permission

to more fully protect them, and then add to their number by transplanting from unprotected areas.

There are a few plants that if protected at all must be protected in the situations they now occupy. If the sites cannot be purchased outright, the owner may be induced to allow the plants to be protected. When plants can be transplanted—and a majority of the showy wild-flowers thrive under such treatment—they might be removed to the grounds surrounding our public schools. Cultivated in such surroundings they would teach botany as well as plant protection. Here, too, the plants should be protected by law, and it would be perhaps best to entrust the supervision of both planting and protection to a board consisting in part at least of botanists and others not connected with the school. And in the end it seems that our aim should be, not simply to protect the wild-flowers, but to make the most of them—to get from them all the beauty, fragrance, pleasure and instruction that we can.

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## PARTRIDGE BERRIES RIPENING INDOORS.

BY MRS. H. A. DeCOSTER.

TWO years ago last autumn I took up some roots of *Mitchella repens* and planted three in a fern dish with small plants of Christmas fern (*Aspidium acrostichoides*), ebony spleenwort (*Asplenium ebeneum*) and spinulose wood fern (*Aspidium spinulosum var. intermedium*). The bright red berries of *Mitchella* kept fresh and plump all through the winter, and in March several flower buds appeared in the axils of the terminal leaves. The buds opened and the little twin flowers were as fragrant and dainty as if growing on their native heath. They seemed to last longer, too, than the same flowers growing in the woods. The berries began to grow after a few days and soon literally pushed the blossoms out of house and home.

When the flowers fell the green berries were fully half-grown, and the last year's berries seemed as plump as ever. They soon began to shrivel, however, and finally,

most of them dropped off. The new berries kept on growing and on April 23rd when I refilled the dish with the delicate young fronds of fragile bladder fern (*Cystopteris fragilis*). I put the *Mitchella* back to see what it would do; it kept right on growing and the berries were ripe before the first of August. This was, of course, an indoors experiment, but, I am sure that in this locality *Mitchella repens* blossoms in late June and early July and ripens its fruit before the first of October. In April and May I find the vines with the berries of the previous year fresh and large, but in June, when I look for the plant in blossom, the few berries I find are small and shrivelled.

*Little Falls, N. Y.*

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## THE FILAREE.

BY M. F. BRADSHAW.

WHEN the first rains come to California, be ready for the botanizing of the new year. For within a few hours the first plants have come to the surface and within a few days have attained a size to show the most indifferent passer what and who they are. The brightest and loveliest of all these precocious children is the filaree (*Erodium cicutarium*). It has with almost incredible swiftness sent out a whorl of leaves that lie flat on the ground in the form of a rosette, long leaves and short leaves alternating in the most exquisite fashion. Each leaf is finely cut like a fern, dark green, with the exception of the first one or two, which have by the time the rosette is formed, turned to the richest red and yellow. These rosettes keep on sending out leaves, growing ever thicker and larger till such a time as the warmth of the sun warrants them in sending up a flower stem. I know of nothing more beautiful in the leaf world, not even ferns.

With the coming of spring you some day suddenly come upon a patch of filaree in bloom. It looks like slender, long-stemmed verbena blossoms, pink or lilac, among dark green ferns, and in a season of abundant rains, they are

truly most enchanting flowers. Belonging to the geranium family, they have persistent sepals and an elongated receptacle bearing the five pistils which grows to about two inches in length.

Up to this time our little filaree has been just uncommonly active and bright and pretty but now it begins to take on deeply cunning ways. It has been pollinated by insects in the usual method, having held plentiful honey inducement, or it could very easily have pollinated itself; but it wants also to make sure its seeds are duly distributed and planted. So the most elaborate and effectual devices to this end have been contrived, outdoing any plant I can now recall. The elongated receptacle having grown mature and brown, it explodes some day when the sun has warmed it well, and the five pistils spring away like bits of bent whalebone. As they fly off, they may be caught by the wind and carried any distance, because of the long, silky hairs on the styles. The ovary that contains the seed is tipped with a hook and is covered with bristles that slope upward and outward; by this device it easily slips into your clothing or the wool of passing sheep, and no more slips out than would a fish-hook.

Besides the hook has a spiral shape and a twisting movement; when it is wet it straightens out, when dry it again twists up. Early in the spring it is matured and has fallen into the dust; after that every dew and fog causes it to straighten itself and every recurring blaze of sunshine makes it again twist into a spiral, the sharp barbed point pushing into the soil. So that all summer long, though we may think the filaree has long since done its work and retired from active duty, down under the dust these canny seeds are burying themselves with an ever elert perception of wet and dry conditions. By the time the first rains of winter have come, which may be as early as October, they are firmly planted and ready to jump to their work above ground.

*Orange, California.*

## A DATE-LEAF BOAT OF ARABIA.

While travelling up the coast of Arabia, last February, the writer's attention was attracted to some curious craft made entirely of date leaves that came along side as the "Pemba" steamed into the desert harbor of Jask on the Arabian coast. The coast of the Persian Gulf is so barren that one can travel for many days along it without finding so much as a stunted tree or shrub, and at this place the only plants of any size were some groves of date palms and a few acacias which had been planted by the English employees of the Persian Gulf cable company which has a station at Jask.

Wood is so scarce in the region that even the roots of such small desert shrubs as are to be found are dug up for fuel, and timber large enough for boat-building would

*A DATE-LEAF BOAT.—Courtesy of the Botanical Gazette.*

have to be brought by water from Bombay. It is necessity, therefore, which has invented these curious date-leaf boats of Jask. They are made of the mid-ribs of the date palm leaf, which are about an inch and a half in diameter and ten feet long. These tough mid-ribs, from which the

leaflets have been removed, are fastened together by means of wooden pegs and strong twine in the form of a boat. No attempt is made to match joints, but a false bottom is built to the craft, and the mass of light mid-ribs that lie beneath this bottom buoy the boat up out of the water, so that the inside remains quite dry. Though in the form of a boat, this curious date-leaf affair is really a boat-shaped raft, for nothing but the fact that the bottom stands high out of the water prevents the waves from entering and flooding it.

They are not pitched or painted in any way, and would doubtless be short lived were they not dried out carefully on the beach whenever the owners are not using them. The paddles are the only parts of the boat which are not made of the date palm, being crooked, irregular poles with the sides of some dry goods box for blades. They indicate the remarkable dearth of wood in the region. They are wierd little crafts, and add one more use to the list of things which can be made from this remarkable desert palm.—*D. G. Fairchild, in Botanical Gazette, for December.*

## THE ADVENT OF SPRING.

The advent of spring is the result of a very complicated series of changes, depending primarily upon the position of the earth in its orbit, which is made manifest to us by the retrogression of winter, the increased temperature of the atmosphere and soil, the awakening of plant life, and the various movements of animals which are induced by migratory instincts. The sum total of impressions received at this attractive period of the year is the effect of the concurrence of many events between which we seek to trace some correlation or to untangle the threads of natural law which gives unity to all the phenomena of nature. The endeavor to fix a date for an event so variable as the advent of spring presents great difficulties. The civil division of the year, in which spring comprises the months of March, April, and May, suggests that astronomically the

date of the vernal equinox, March 21, may be considered the beginning of spring for the northern hemisphere. From the present point of view, however, the date, applying to the northern hemisphere as a whole, has no significance in the tropics or the polar regions, neither of which can be said strictly to have a spring. While the event is a general climatic one, it is also local in character, and is modified for any place by its latitude and geographical position, by altitude or proximity to the sea, and by many minor features of topography. Spring arrives earlier in a sheltered valley or on a southern declivity than on a bleak hillside exposed to the north wind. The successive movements of cold waves of ever diminishing force also show that the advance of spring is not like the steady progress of the crest of a flood wave, but fluctuates—now advancing, now retreating, always slowly gaining, so that summer becomes dominant almost inpreceptibly.

Of the manifold changes following the retreat of somber winter, which shall be used as the criterion for the advent of spring? Many events have been proposed for this purpose, as the breaking up of ice in rivers and the reopening of navigation, the movements of animals, the earlier phrases of the growth of vegetation, and those employed by the meteorologist, as the advance of an adopted isotherm of mean temperature, or others depending on some supposed relation between climate and the other phenomena mentioned. It may be interesting to discuss each of these briefly.

The first named—the breaking up of ice and resumption of navigation—will necessarily find only limited application in northern regions, where the rivers remain frozen throughout the winter. Anyone interested in studying the average dates of the reopening of navigation in the northern rivers and the Great Lakes will find ample material in the Monthly Weather Reviews. At many places the arrivel of the first boat is an event of much importance. The average date for the reopening of the Hudson River at Albany is March 19, from records extending back to 1786.

The average date for the opening of the Kennebec at Augusta, Me., is April 6. A general examination of data of this kind, however, will show that the dates so found are too early to represent the advent of spring. As our object is to secure data for a sufficiently large number of stations throughout the United States to enable the construction of a chart graphically illustrating the successive advance of spring, the use of this criterion is impossible for lack of material in the warmer regions of the South, where the rivers never freeze.

The movements of migratory birds or of hibernating animals afford a very unsatisfactory means of determining the approach of spring. A sufficiently large number of trustworthy observations is not available, and most of the movements recorded are not made for the reasons usually assumed. It is a common error to suppose that animals, by some unknown sense, are able to foresee weather changes, and this vitiates the scientific value of most of the observations recorded. Very often these migrations are simply brought about by the exhaustion of the food supply in a certain region. It is true that many animals possess a superior sense of smell, of taste, or of hearing, perhaps a finer sensitiveness to minute atmospheric disturbances, which man has lost by his artificial mode of life (the use of fire, clothing, and shelter) removing him, in a measure, from the direct influence of nature; but for this loss he is fully compensated by his ability to invent and use the delicate instruments of modern scientific research. The special faculty, seemingly possessed by many animals, of anticipating the seasons is not due to a superior knowledge of meteorology, but is the result of experience during past ages, transmitted from one generation to another by inheritance, and producing the fixed habits of life now observed. Many curious observations in regard to the first appearance of the ground squirrel, the migration of swallows, the far-off song of wild geese hurrying northward, may be found in that old classic, White's Natural History of Selborne, which contains also a model naturalist's calendar for that locality.

From the point of view of the naturalist, the ideal criterion of the advance of spring must be the awakening of plant life. Plants are fixed in their habitat, and are subjected to all the influences of their environment, and while the progress of growth is largely controlled by chemical and physical features of the soil, the chief factors must be temperature, moisture, and sunshine. Plants reflect perfectly the successive phrases of the grand panorama of the seasons from the moment when the first warm breath persuades the crocus to push up its flowers through the snow. The determination of the commencement of the various phenoma of plant life, of the unfolding of the foliage and flower, the ripening of the fruit, and fall of the leaf, in their relation to the seasonal changes that take place, constitute the so-called phenological observations. Phenology is extremely important in the study of the geography of plants, and is of no less value for climatology, though meteorologists have rather neglected this attractive work. The large mass of material available must generally be sought in botanical works, and it is to be regretted that the memoir on the subject of phenology prepared by Prof. Cleveland Abbe in 1891 was not published by the Weather Bureau.

The difference in the behavior of different species of plants serves to give account of the gradual advance of spring. Thus the snowdrop, bloodroot, and claytonia herald the earliest touch of spring; peaches and cherries bloom early, and often suffer for their intrepidity; while oaks and walnuts are slow to respond to the influence of warm weather. There are two ways of utilizing the material furnished by phenological observations. By comparing the dates of blossoming of the same species of plant at different places, the retardation of vegetative development with increasing latitude is brought out, with such variations as may be caused by topographical features. Using the island of Lesina in the Adriatic Sea (latitude 43° N.) as the starting point, it has been found that spring at Paris (latitude 48°) is retarded forty-three days, at Brus-

sels (latitude 50°) fifty days, and at Christiania (latitude 60°) eighty-six days. In continental Russia the retardation is much greater, and while at Paris many spring plants are in full bloom, vegetation on the Russian steppes, at the same latitude, is still deep in winter sleep. Again, we may ascertain the places where spring plants blossom simultaneously, and a comparison of the latitudes will reveal the influence of climate. Thus, at New York, which is at the same latitude as Naples, plants blossom at the same time as at Marburg, Germany, 10° latitude farther north.

Comprehensive statistics of this kind are available and would repay detailed investigation. I think, however, in phenological observations too exclusive attention is given to the effect of temperature on growth. The condition of the soil, which is the seat of complicated physical and chemical changes, is of the highest importance to the growth of vegetation, and it may be that frequently the permanent warmth of the soil has more to do with starting the flow of sap in spring than the temperature of the air, since in countries without a winter covering of snow the temperature of the soil is higher than that of the air above it throughout the year. The influence of moisture is also largely neglected. In tropical countries many plants undergo a period of rest during the dry season, which corresponds with our winter, and an increase in the amount of moisture at the beginning of the rainy season calls forth all the phenomena of a luxuriant spring. In addition, while many plants possess elaborate means of protection from excessive loss of moisture by transpiration, it is still doubtful whether any means of protection from changes of temperature have been discovered. A botanist can tell at a glance whether a plant occupied an arid or a humid region, but he can not say that it belonged to the flora of a cold or warm climate.

The determination of spring by the successive advance of an adopted isothermal line is the method which naturally commends itself to the meteorologist, and is the only

one possible for the purpose of a graphic representation. The endeavor is made at the same time to select an isotherm which has some distinct relation to the phenomena of plant growth. The only attempt of this kind with which I am acquainted was made by Prof. Mark W. Harrington, in Harper's Magazine for May, 1894. Prof. Harrington accepted as the criterion the advance of an isothermal line of 43.8° F., and endeavored to establish a causal relation between the adopted temperature and the beginning of development in plants, in the following words:

"Botanists state that the temperature of 43.8° F. is that at which the protoplasmic contents of the vegetable cell find the limit of their activity. When the temperature falls below that point the protoplasm becomes inactive, though it is not dead until the fall is from several to many degrees lower, depending on the species of plant. When the temperature rises and reaches that point the protoplasm awakens, and as it passes above 42.8° F. the cells begin to grow and multiply. The advent of spring may be considered to take place at the advent of an isotherm 1° higher, or 43.8° F."

The statement seems to me to be open to serious criticism, and the isothermal line adopted is really quite arbitrary and with very little relation to the phenomena it is supposed to mark. It can only be conceded that the rapid and agreeable change from the dull gray of the forests to a refreshing green does not occur much below that temperature, but otherwise it corresponds with no particular stage of vegetative growth.

A more practical criterion of the advent of spring is certainly to be found in the average date of the last killing frost or occurence of a minimum temperature of 32°, an event which has been determined with considerable accuracy for a large number of stations throughout the United States. A killing frost is defined as one which will cause the death of relatively hardy vegetation, including nearly all the plants of ordinary cultivation. It is well known

that the young and tender vegetation of spring is easily destroyed by frost, and the important role played by the physical properties of water in the process are now well understood. Freezing depends on whether the affinity of the protoplasm for water is less than the molecular forces causing crystallization. If the affinity of the protoplasm for moisture is overcome, the water exudes from the cells into the intercellular spaces, where it crystallizes, and death results from the loss of water at a time when metabolic processes are at a minimum. From the point of agricultural interests the first and last killing frosts are events of much practical importance, which often exert a marked influence on the yield of crops. They determine, in fact, the limits of the growing periods of most crops, and the immense damage often done by late frosts has led to strenuous efforts to secure means of protection. Consequently the last killing frost, as a natural event easily determined, with a distinctive influence on vegetation, may correctly be considered as marking the final passage of winter, the point of beginning of uninterrupted progress in the growth of vegetation—the advent of spring.

Many facts of great interest appear in this connection. The earliest date recorded is January 20, at San Diego; since, however, the people of south California claim perpetual summer for that delightful climate, we can hardly permit them to enjoy the pleasures of spring. By February 1 spring has commenced along the entire coast line of the Gulf of Mexico and over Florida, but its progress during February and March is rather slow. The line for April 1 starts from a point on the Atlantic coast some distance north of Norfolk, Va., passes southwest through eastern North Carolina, curves around the south end of the Alleghenies, passes through Nashville, Tenn., above Cairo, Ill., and thence takes a wide southward bend below the Rocky mountain region; in the extreme west it passes directly northward along the western edge of the Sierra Nevada Mountains, and leaves the United States north of Seattle, Wash. Thus spring prevails over the entire Pacific

coast region and throughout the cotton belt by the beginning of April. The advent of spring occurs during April throughout the larger portion of the United States, including the Middle and North Atlantic States, the Ohio and central Mississippi valleys, the eastern and southern slopes of the Rocky mountain region and sheltered valleys in the west, and is deferred to May only along the northern border from Northfield, Vt., through the upper lake region, and over the two most elevated regions of the west, the Rockies from Denver to Helena, and the Sierra Nevada of eastern California and Oregon.

The change from winter to spring is of course profoundly modified by the larger topographical features of the country, as well as by the influence of position in regard to the prevailing course of storms. There is a marked trend northward of the lines both on the Atlantic and the Pacific coasts, so much more pronounced on the latter that spring has already commenced at Portland, Oreg., and Tacoma, Wash., before it reaches Norfolk, 10° of latitude farther south.—*Charles F. Von Herrmann, in Proceedings of Second Convention of Weather Bureau Officials.*

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## Note and Comment.

WANTED.—Short notes of interest to the general botanist are always in demand for this department. Our readers are invited to make this the place of publication for their botanical items.

PROFUSE BLOOMING OF THE SASSAFRAS.—Throughout eastern Pennsylvania this year, the sassafras trees were heavy with bloom, to find a tree without flower being the exception. In other years the reverse of this has been the rule and, in this section, to find the sassafras tree in bloom was rare indeed. Does this profusion of sassafras bloom prevail elsewhere, or is it a difference due to peculiar conditions of locality?—*Edwin C. Jellett, Germantown, Pa.*

OFFICERS OF THE BOTANICAL CLUB.—The first annual election of the American Botanical Club gave the following officers for 1903: President, Willard N. Clute; first vice-president, Miss Pauline Kaufman; second vice-president, Miss Angie M. Ryan; secretary, J. C. Buchheister; treasurer, Frank A. Suter. The membership has nearly reached the hundred mark and a profitable year is anticipated. The Constitution and list of members are to be published with the annual report of the officers.

POPPY SEED AS FOOD.—Few Americans except the importers are aware that vast quantities of poppy seeds are annually brought into this country to be used as food. It is considered in the nature of a condiment and mixed with bread, biscuit and cake, and although the seeds are very small, they are often ground still finer for the purpose. In America the use of poppy seed is confined almost exclusively to immigrants from Austrian and Turkish provinces.

THE TASTE OF POISON IVY.—Strolling through our cemetery one day in early spring, I noticed some shrubby plants with light gray bark. I stopped to examine them, as they looked unlike anything I knew, and finally tasted of the bark. The taste was very strong of black pepper; this aroused my curiosity, and I spent much time in looking through botanies and other books likely to give me information, for a native shrub with a spicy taste, but could find nothing. After two or three weeks I was again in the vicinity, and found the plant had developed leaves when to my horror, I found it was poison ivy. A moment's thought convinced me of the folly of fear, so long after my rash experiment. The vine I have always handled with impunity, but should hardly have ventured to test it in this way, if I had known what I was tasting. I have since looked long for any notice of this peculiar quality, but find nothing in medical or scientific books regarding it.—*Mrs. E. C. Anthony, Gouveneur, N. Y.*

[The editor is acquainted with an old gentleman who

delights to stroll barefoot about his fields in summertime. Happening one day to pass through some poison ivy he was promptly poisoned, but the next day, being of an experimental turn of mind, he returned to the ivy and ate some of the leaves as a cure, possibly actuated by the old idea that the hair of a dog will cure its bite. If any of our readers who are proof against the ivy will kindly repeat Mrs. Anthony's experiment and let us know the results, we will be much gratified.—Ed.]

A Pretty Experiment With the Yellow Birch.—One who happens in the woods this winter may produce a pleasing picture by touching a lighted match to the shaggy base of the yellow birch. The resin in these papery layers of bark cause them to burn readily and the flame rapidly mounts upward often into the treetops. This experiment does no harm to the tree and when snow is on the ground there is no danger of setting fire to the grove. The orange flame and blue smoke seen against the background of snow-laden evergreens forms a sight worth seeing.

Seed Dispersal of the Violets.—When I began to cultivate plants in a botanic garden some twenty-five years ago, I thought it would be very nice to have as many kinds of violets as I could get, growing close together in one group. All went well for about three years when I found my plants hopelessly mixed, because the seeds were shot several feet from the parent plants. For a long time I have planted the violets each in a separate place about the garden to enable me to keep them pure. The best shooter of the lot is *Viola alpestris* which frequently scatters its seeds ten feet in either direstion.—*W. J. Beal in Rhodora.*

# Editorial.

The *Plant World* said recently—and in this case the *Plant World* evidently knows what it is talking about—that within four years, specimens cut from *a single tree* have been passed upon by different experts with the result that thus far they have made sixteen different species of it. Those who are familiar with the ways of the modern species-maker will scarcely be surprised at this announcement, however much they may deplore such a state of affairs. The fact is, that the differences between many so-called species are so slight, that even the eminent specialists are not always able to discern them. One of the canons of the radical school is that if a plant has a single distinguishing character, no matter what that character is, and will come true from seed—that is, will continue to reproduce itself—it is entitled to specific rank. The fallacy of such a contention is easily shown by a reference to any market-gardeners catalogue, where there are hundreds of plants described that answer all the requirements for such "species." No scientist at present would consider these to be species, though it is not improbable that in time the radicals may come to even this.

* * *

Along with the drawing of fine lines for species, the conception of the genus has been slowly changing; for if these variants are to be called species, the group to which they belong must be the genus, and the genus as we knew it a few years ago will have to be considered as an order, at least. As yet no botanist has had the hardihood to seriously suggest this, the practice being to make use of the indefinite term "group" for a sort of sub-division of the genus as the *Cratægus tomentosa* group, the *Panicum dichotomum* group, the *Viola cucullata* group, the *Botrychium ternatum* group and so on. A still more clumsy method of designating real species and their variations is found in the naming of the first as super-species and the latter as subspecies. It would be far better to cling to

our original conception of genus and species and call the variations from the type, "forms," as the fern students do; but this is not likely to be popular so long as there appears to be greater glory in calling them species.

* * *

From time to time vigorous protests have been made against the giving of specific rank to trifling variations of plants, but after the smoke of battle has cleared away, it will probably be found that the "species-splitters," as they have been dubbed, in their search for new forms have done the science of botany a great service, and at the same time wrought their own undoing. The search for "new species" is having the effect of turning attention to these minor forms, and the discovery of each new one adds but another link to the chain from one true species to another. After all are accounted for, it is easy for the botanist to see which are valid species and the others will then be reduced to forms, just as has recently happened in the cases of the white birches and of the genus *Nemophila*. In days to come these "splitters" will be regarded much as the botanical world now regard Gerard and Rafinesque.

* * *

There are many variations from the type that are distributed over definite ranges; but the practice of naming new species from single specimens, without knowing whether there is another one in the world, is becoming much too common. The botanist finds among a bundle of dried plants, a specimen differing from the type in some slight particular, and at once jumps to the conclusion that it is new, apparently, forgetting how much sunlight, soil, exposure and moisture may change the same species. *Pyrola oxypetala* is a classic example of this. The only specimens of it ever collected, now lie, bug eaten and dilapidated in the herbarium of Columbia University. They differ from *Pyrola secunda* principally in having sharper pointed leaves and petals and there can be little doubt that *oxypetala* is a mere form of *secunda*. And yet every manual calls this a good species and future books will doubtless continue to insisit upon it.

In the midst of all the species making it is encouraging to find a growing tendency toward more rational criteria in the work. In recent publications we have noticed that authors are beginning to speak of certain well-known species as "centers of variation," and to reduce many forms hitherto styled "species" to varieties. The older botanists were quite as sharp-eyed as those of the present day and were not deceived by slight differences in form. Few of the species named by them have ever had to be reduced. Those who are inclined to be troubled over the present multiplication of species may be assured that the tide is beginning to turn and that the mere varieties that have been given specific rank will ultimately find their proper level.

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*Popular Science News*, for thirty-six years a representative journal of the natural sciences and itself the swallower of a score or more of similar publications, has at last been overtaken by the same fate, and merged with *The American Inventor* of Washington, which will hereafter contain a department devoted to Popular Science. While both journals will receive the benefit of an increased circulation by the combination we cannot but regret the passing of such an ably conducted and valuable publication as *Popular Science News*. The new journal has our best wishes for success.

* * *

The doctors who pronounced *Meehans' Monthly* dead, last December, appear to have been mistaken in their diagnosis. Even the editor said it was dead, but it turns out that it was only in a state of suspended animation. In January it suddenly revived but in such changed form and name as to suggest that it had passed through some such metamorphosis as insects do. It is now 10 by 14 inches in size and known as *Floral Life*. Mr. S. Mendelson Meehan, its former editor, will continue in charge. J. E. Winner is the publisher; we trust that he may also prove to be A Winner.

# THE AMERICAN BOTANIST.

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## EARLY SPRING IN SOUTHERN CALIFORNIA.

BY C. F. SAUNDERS.

TO my eastern eyes mid-winter in Southern California, after there had been a few rains, offered a very good substitute for spring. The pastures lay green in the warm sunshine and the buds upon the chapparal shrubs were swollen, many of them, to the point of bursting. Along water courses the willow-groundsel was blooming and here and there by the roadside a cluster of yellow poppies would flash a brilliant salutation—reminders that Flora, if she really sleeps at all in this land, sleeps at least with one eye wide open. As early as New Year's, patches of white amid the dun hillside shrubs advertised the so-called California lilac in bloom—not a lilac at all, however, but a western cousin of our old friend of the East, the New Jersey tea (*Ceanothus*). This genus, readily recognized by its clusters of small flowers with long clawed petals that resemble tiny bonnets elevated on sticks, is represented in California by numerous tall, shrubby species, some, indeed, attaining the dignity of trees. When in bloom, they are in bloom all over, and their white masses of flowers shine out from the midst of the evergreen scrub-oak brush—a favorite situation—like whitecaps on an emerald sea.

All this, however, I found was not really spring, which first began to make itself apparent in unmistakable fashion about the middle of February. Then I noticed that the gray sycamores that live in the dry river bed by our western hills, had cast the winter wrappings of their buds to the winds, and a tender haze born of the infant leafage had spread through all the tree tops, so that the thirsty

water course was filled with a flood of dreamy bronze-green color that comes to earth only in the season which the poets call "the sweet o' the year." In fields where but a day or two before a single poppy showed, now tens of thousands were opened to drink in the sun, and little companies of women and children were busy gathering them. This is the flower that more than any other is associated with California, and the one that every visitor, whether flower-lover or not, includes among the sights to be seen. It is an extremely sociable plant, just as the eastern ox-eye daisy is and when in bloom makes extensive sheets of intense color, visible for long distances. In some judgments, the flower is less attractive in the mass than singly as its strong orange-yellow tone becomes a somewhat rusty color when seen in expanses close to the ground. One especial beauty of the blossom in nature is a peculiar satiny sheen which seems to baffle the artists who attempt to reproduce it. The botanical name of this poppy (*Escholtzia*) is so barbarous that it is a relief to turn to the Spanish name for it, "Copa de oro," meaning "cup of gold."

Not to the fields, however, so much as to the unbroken soil along the arroyos and to the moist canons among the hills, must one go to find many of the most characteristic blossoms of the opening season. Among these the Easterner finds almost no familiar floral face, but many exhibiting family traits that show them to be near relatives of familiar spring flowers of home. Thus in our early vernal rambles in the vicinity of Pasadena, we found the crowfoot family putting itself on view, but only in the shape of one species of woodland buttercup and the wild peony. The latter (*Pæonia Californica*) we had found in January sending up red shoots which closely resemble those of the old fashioned garden favorite. The flowers, which we found in abundance a month later, are inconspicuous compared with the blushing posies borne by the cultivated peony—the brownish red petals concave and inclined to hide themselves shyly within the calyx. They

have an agreeable perfume, resembling liquorice. In damp, shaded situations such as would be clothed in the states of the Atlantic border with spring beauties (*Claytonia Virginica*), we find in California an abundance of a closely related species (*C. perfoliata*), popularly known as Indian or miner's lettuce. Like the spring beauty, it has fat, succulent leaves, but the blades instead of being all rather linear, are often expanded into round, flat salvers from the center of which the small white flowers arise on a slender stalk. In favored spots the plants make a lush growth and have been used by country folk and Indians as a salad, as the common name implies. Nearly related to this but very different in appearance, is another characteristic blossom of early spring, the Calandrinia, whose cheerful, magenta flowers dotting the grass by the wayssides, remind one a little of the portulaca to whose family they belong.

The phlox family has many charming representatives throughout California in the gilias—a genus of multitudinous species, one of which, the fringed gilia, is very common in the southern part of the state and wins anybody's heart at first sight. The plant is a delicate little thing, frequently but an inch high and quite overshadowed by the white or pinkish flower which has a yellow center and somewhat resembles the wild pink.

In this early spring congress of the flowers, the pea tribe takes a prominent part—notably an exquisite lathyrus that climbs over bushes and adorns its host with drooping garlands of large, sweet-pea-like blooms; a shrubby *Hosackia*, popularly known as deerweed, with graceful, willowy branches decked with umbels of little golden flowers, turning red in age; and many sorts of lupines, one of which is particularly interesting because of its foliage—the leaflets being cut off square at the tips as though snipped by scissors.

To this floral kaleidoscope, the waterleaf family contributes a dash of azure in the genus *Nemophila*. One species of this, a low, spreading plant with rather coarse

pinnate leaves, bears a clear blue flower that looks at one so trustfully and innocently that it has come to be known in popular speech as baby-blue-eyes. Another common blue flower which appears in February or even earlier, is the familiar Brodiea, a liliaceous plant with long grass-like leaves and tall, naked flower stalks tipped with a close cluster of conspicuous bloom. Country people sometimes call the plant wild onion, which, if unpoetic, is less inaccurate than some popular names, for it and the onion are near akin. The brodiea is one of the few wild flowers of California that can be plucked and sent east with reasonable assurance of carrying fresh. Buds, however, should be gathered for this purpose. Under ordinary conditions they remain unopen in the package if surrounded with damp paper at the start; and put at once into water on arrival at their destination, will in all likelihood expand and remain fresh for several days. Of violets, which form such a feature in the spring flora of the East, Southern California has but one, I believe—that an exquisite yellow one tinted with brown on the back of the upper petals, and so large as to have won for itself the common name of pansy. Botanically it is known as *Viola pedunculata*.

A very conspicuous vernal bloom in this Land of Sunshine is that of the Chilicothe—a rapidly growing vine of the gourd family, which clambers over bushes in low grounds and bears abundant racemes of showy white flowers. Like the eastern man-of-the-earth (*Ipomœa pandurata*) it has an enormous root, said to be sometimes as big as the trunk of a man. One of the pleasant sights that linger in the writer's memory is a small tree of the California holly laden with its bright red berries and over it, like a flowerd mantle of tender green, a chilicothe vine in full bloom. It seemed to typify the conquest of winter by spring.

*Pasadena, Calif.*

# CONCERNING NOMENCLATURE.

BY CHAS. D. TURNBULL.

ACCORDING to Genesis, "Adam gave names to all cattle and to the fowl of the air and to every beast of the field," and we have therefore authority to declare that although Father Adam named both bird and beast, he woefully neglected the flower, and left the task to the fancy and haphazard desires of his descendants. So it happened that every people and tribe had its own collection of names; and the names of one nation's flower did not describe another's. With the spread of botanical science, these limits became annoying—to the scientific folk—and soon came Linnæns with his systematic botany, who bestowed long, heavy names on the small weak flowers. Burdock became *Lappa major*, our own colt's foot was burdened with *Tussilago farfara* and there were still heavier names for the timid ones who had hidden in fright. Now all things have their time and place, are necessities, but who thinks of *Houstonia cœrulea* when he sees the innocents coloring the pastures in spring? Therefore let us preserve our Latin and Greek mouthful, in the manual and when we meet ragged robin we shall greet him, ragged robin, not *Lychnis floscuculi.*

Many of our common plant names have descended to us from early Saxon times. Witness nettle, henbit, pimpernel, thyme, hyssop, hollyhock, woad, cowslip and many more. Many are of such ancient origin that the original orthography is obscure and forgotten. The silent h in thyme is a Latin affectation adopted at the time of the Renaissance and is an instance of its widespread influence on northern European civilization. H in hyssop has also been adopted; it was once issop or yssop. Hollyhock is of the deepest antiquity, dating from the troublous times of the Crusades. Hock was the early English word for mallow of which family this plant is a member, and being brought from the Holy Land by returning Palmers and Crusaders it naturally acquired the title hollyhock.

It is to be regretted that we have no true rooted English name for the dandelion. Our modern name has been corrupted, with characteristic English freedom, from the French, *dent de lion*, not referring to the more important blossom but to the sharp irregular margin of the leaves. Why did not our reverend ancestors name it jewell of the pasture or medowegold? We are an English people; let us have true English names for our flowers, so far as we can.

As coats of arms to men is the word "wort" to flowers. Wort in the older times signified an herb or plant and our forefathers incorporated it with some fancied resemblence or reputed virtue to form a discriptive name. Witness, awlwort, whose root is awl shaped; toothwort, whose seed resemble teeth; woundwort, with reputed healing virtue; madwort, powerful in alloying rage and afflictions of the mind; sneezewort, lungwort, saltwort, and liverwort.

In the early English time Jack and Jill or Gill were familiar and common names used in place of lad and lassie. Gill has since disappeared from modern English, always excepting nursery rhymes, but is yet alive in quaint Gill-over-the-ground. Sometimes we call it alehoof a word equally quaint and smacking of the home brewed and brown draught of merry England.

The white settler's contempt for the Indian in general prejudiced him against remembering these names for native flowers. Pipsissewa, poke and puccoon seem to be all that were adopted. How much more appropriate it would be to call native flowers by native names. Poke was corrupted from pocan by the whites who being practical people, probably considered one syllable sufficient for such mushroom growth.

Many names are self-explanatory, such as duckmeat, a pond weed eated by water fowl, and crowfoot, discriptive of the much divided leaf. Shadberry is a plain New England name given the bush because it blooms at the season when shad ascend the streams to spawn; blood-

root, live-for-ever and life-ever-lasting require no hint. We can understand the origin of witch hazel when we know that hasail was a Saxon word for headdress, alluding to the peculiar flowers. The ancient name of our vervain of the pasture was ferfaen, Celtic, meaning to remove stone, though its application is obscure, its natural habitat not being in rocky situations.

*Hartford, Conn.*

## A RARE PERFUME.

BY MRS. A. E. GOETTING.

IN my wanderings I have several times been arrested by a peculiar spicy perfume that always recalls the appetising one that floated out from the box where grandmother kept her spice cookies. I first noticed it in Wisconsin as I wandered by a prairie stream flowing through black muck. It is an elusive perfume that comes and goes. Is it possible that the breath of these flowers is only liberated by their insect friends? After days of searching the perfume led me to the ground-nut (*Apios*) whose small dark purple blossoms easily hid in the tangled undergrowth.

Walking by the side of a crazy North Carolina stream in 1896 the south wind bore to us this perfume that I had not smelled for years. It could not be the ground-nut for the situation was wrong; then too the perfume was finer and spicier. Our hunt that day was unsuccessful, but a few days later, sometime in April, we came upon the same incense, a little further south in a shady beech-wood off from the main creek. This time the sharper eyes of two of my young botanists discovered the purple-brown spikes of the North Carolina beech-drops or sweet pine sap (*Schweinitzia odorata*). The brown leaves so effectually concealed the leafless plant that, like the ground-nut, the perfume led to the discovery.

When I showed my treasure to my friend, she told me how she had known Schweinitzia, and how though she had scented the flower she had never been able to find one.

Back into the old box had gone the perfume of these two flowers, when I visited with a friend some woods on the lower Cape Fear river in April of 1901. "I want to find for you," she said, "the sweetest flower in North Carolina. We call it a blue-bell and its breath is of rare old spices." At last along a ditch it was found growing in a tangle over brush and black-berry vines, but the buds had to be picked open—the *Clematis crispa*! When I reached Virginia I received a letter containing the blossoms and the envelope held a perfume like that of the beech-drop. Here, too, on the Dismal Swamp Canal, I was taken to see the rarest of flowers of this region, according to a botanical expert from Washington, it was the "North Carolina blue-bell."

In the summer a few of the roots sent to Wisconsin had been carefully nursed in pots and one blossomed. The apios is easily cultivated, but can this clematis stand our northern winters? A plant lover in Durham, North Carolina, said it took kindly to cultivation in that state.

*Cincinnati, Ohio.*

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## PERSONAL NAMES IN NOMENCLATURE.

As is well known to readers of my publication, "Mycological Notes," my views on the subject are very radical. I advocate strongly the discontinuance in current literature of the use of personal names after the names of plants. I believe that the custom of citing personal names is conducive to more harm, more confusion, more synonyms, more invalid "new species," more changing of old names, than all other agencies combined. It is not denied by any one that the various names we have for a plant, (synonyms), are both a great weight and a great hindrance to the science. Botanists meet and pass rules for the naming of plants, but they cannot agree on any set of rules, and never will as long as the members are vitally interested in the particular rules that perpetuate their own names and the plant names that have been proposed by themselves.

Botanical nomenclature is, theoretically at least, a language, and should reach stability by custom and good usage, and by that alone it will do so. Can we expect stability, when we offer a standing reward by which the man who wishes a change in a plant's name has his own name cited thereafter in connection with it? If this be not the cause of much name changing, it is no less a fact that under such a system, synonyms have reached their present unwieldy bulk and are growing every day, and I believe will increase to the end of all time, under present methods.

As long as a new combination, some "prior" generic name, some "prior" specific name, some slight variation in shape of leaf or bract or even color of anther, stands as a reward by which some men can cite their own names as authority for a new species, instead of those of another man, trivial excuses for such acts will be found. It is no less justice to the men who are not afflicted with such a craving to conspicuity, than to prevent injustice, that the change of method be made.—*From article by C. G. Lloyd in American Journal of Pharmacy.*

## SOME QUEER TEAS.

Some time ago, there appeared in the London *Globe* an article with the above title which we reproduce here for its bearing upon American plants. New Jersey tea, made from the leaves of *Ceanothus Americanus* seems to have escaped the writer's notice but it would doubtless be much more palatable than that made from the ribwort.

"In early tea drinking days, when fragrant Bohea was sold for from twelve to twenty shillings and more a pound poor folk, who could not afford such a luxury, endeavoured to content themselves with decoctions from less expensive leaves. A great favourite of old was sage tea, which was regarded not only as a pleasant but a particularly wholesome drink. John Wesley, who was a determined opponent of the Chinese leaf, strongly recommended sage as well as mint and pennyroyal, as an excellent substitute;

while another enemy of the cup that cheers ventured to prophesy about the middle of the eighteenth century that the pernicious foreign leaves would quickly become cheaper, wherein he was right, and that tea would then go out of fashion and be replaced by sage, wherein he was hopelessly wrong. At the time when this wise person wrote, an ordinary breakfast among the poorer folk was bread and butter with sage tea; but the cheapening of the real tea simply drove such substitutes as sage out of use. In revolutionary days in America various herbal substitutes for tea were used from patriotic motives. After the Boston mob had thrown the cargoes of the three East India tea-ships into the harbour, and the colonists had taken a vow to buy no tea which had to pay the obnoxious duty, their wives and daughters—'daughters of liberty' they called themselves—devoted their ingenuity to devising fragrant beverages to take the place of the boycotted leaf from the Far East; and some strange decoctions were made and perhaps enjoyed. The stalwart New Englanders drank 'tea' made from the leaves of ribwort, strawberry plants, and currant bushes, sage, thoroughwort and other herbs. So-called 'Liberty Tea' was made from the four-leaved loosestrife, while 'Hyperion Tea,' says Mrs. Earle—an invaluable chronicler of colonial life and habits—was from 'raspberry leaves,' and was said by good patriots to be 'very delicate and most excellent.' The beverage may have been so when tasted by patriotic palates, but we can feel pretty certain that many a colonial dame must have thought with longing of the cups of fragrant Hyson which she had been accustomed to enjoy before the embargo was laid on the imported leaf. One at least of the substitutes named above, thoroughwort, is still used in rural New England for medicinal purposes, if Miss Wilkins's stories may be accepted as authorities. No reader of those delightful sketches will forget how often thoroughwort tea, as a remedy, especially for an ailing or more often supposedly ailing child, is suggested and made by village wisdom. Rural medicine of the same

kind is, of course, common enough also on this side the Atlantic. Herbal remedies might not be used quite so much, perhaps, nowadays as in times gone by, but 'teas' from herbs of various kind, are still brewed and firmly believed in by many country folk. Valerian for instance, which is commonly known by the significant popular name of 'allheal,' is one of these herbs, for the 'tea' made from its root is believed to be of efficacy in cases of consumption. An infusion of milk-wort—the plant whose pretty flowers, varying in colour from pink to a deep blue or purple, are so abundant on dry, upland pastures—is good for a cough. In Sussex villages 'gazel-tea' is a favourite prescription for a cold. Berries of any kind are called 'gazels,' but those usually employed for medicinal purposes are black currants. But much stranger things than black currants have been similarly used. For example, when Queen Anne was known to be suffering from gout, a certain Martin Bowes wrote to the Prime Minister, the Earl of Oxford, suggesting as an easy cure a decoction, or tea, made of 'nettle-seed.' Not a few of the herbal teas which were drunk as beverages were, like New England thoroughwort, also considered to have no small medicinal value."

## CLEAVAGE PLANES OF PLANTS.

So small a thing as the falling of a leaf is a matter of considerable preparation on the part of the plant. A brittle zone has to be formed across the petiole so that the leaf may break away from the twig when all is ready. Similar cleavage planes have lately been found in the twigs of many woody plants and it has been shown conclusively that just as the plant drops its leaves, it also sheds many of its twigs. The leaves are dropped only when their work is finished and twigs are dropped for the same reason.

Among the more interesting phases of the subject are the cleavage planes developed to separate the fruit from the plant that bears it. Prof. Schaffner, who has carried

on most of the investigations regarding cleavage planes tells of this phase of the work in *The Ohio Naturalist*. "In the simplest cases a cleavage plant is formed at the base of the fruit which falls off while the peduncle dries and decays away. This is the case in *Rhus glabra*. In others the separation layer is formed at or near the base of the peduncle, as for example in the ground cherry (*Physalis pruinosa*). In this herb a very perfect cleavage plane is formed in the peduncle. In the apple and pear the separation of the fruit from the tree is accomplished in the same way by the development of a rather imperfect cleavage plane or separation layer. In some plants as in *Prunus Americana* or in *Benzoin benzoin* the fruit first falls off and afterward a cleavage plane is formed at the base of the peduncle. In the plum the peduncle sometimes dries up and is not immediately shed, though the separation layer is formed. When the fruit is produced on panicles or cymes there are also several methods of procedure. In the dogwoods as in *Cornus* asperifolia the berries drop off singly and later the fruiting cyme is closely excised by a smooth cleavage plane; while in the smooth sumac, as stated before, the berries drop off in the same way but the much branched panicle remains to decay gradually. In the chestnut (*Castanea dentata*) the stems which bear the burs become quite woody but a cleavage plane is formed and the entire fruiting branch is thus pruned off."

## Note and Comment.

WANTED.—Short notes of interest to the general botanist are always in demand for this department. Our readers are invited to make this the place of publication for their botanical items.

THE PARA RUBBER TREE'S GUARDIAN.—The seed of the para rubber tree (*Hevia*) is an edible and oily nut that is sought by many of the forest inhabitants. According

to a writer in *Indian Gardening* a certain large and venomous snake, the *saracucu*, seems to have found this out and during the fruiting season lies in wait at the base of the tree for such small game as may be attracted by the seeds. In thus warding off the animals that would destroy the seeds, the snake is supposed to contribute not a little to the preservation of the species.

NYMPHÆA FLAVA.—It may interest your readers to hear of the entire disappearance of *Nymphæa flava* from this part of the St. Johns River. There are three localities near here where there were hundreds and thousands of plants a few years ago; now not one can be found. They have not been dug or gathered, but simply smothered by the masses of water hyacinth, (*Eichornia speciosa.*)—*W. C. Steele, Switzerland, Fla.*

NITROGEN IN FLOWERS.—It is surprising to learn that in some parts of the world flowers are valued as food for the amount of nitrogen they contain. The poorer classes of India are said to use the flowers of *Calligonum polygonoides* for this reason, and they are reported to be a "desirable addition to foods that are poor in nitrogen." These flowers contain about 2.64 per cent of nitrogen. The flower of sugar cane contains 1.70 per cent, those of the English elm 3.50 per cent and those of yellow creeper (*Bignonia ungius*) 4.19 per cent.

BIRCH SAP.—"The river birch (*Betula nigra*) is, indeed, a fountain of refreshment in March when the sap is running and refuses no thirsty wayfarer who taps it," says a writer in the *Philadelphia Record*. "Thrust your knife into the bark, insert a splinter at a declining angle, hold a cup to catch the drippings, and you have in a few minutes a mouthful of a beverage as clear and cool as spring water, with the faintest possible suggestion of sugar in it." The black birch (*Betula lenta*) and the yellow birch (*B. lutea*) are also noted for their abundant sap. The black birch is sometimes tapped for the purpose of making a sort of beer from the fermented sap.

WHY ARE SPECIES OF RHUS POISONOUS?—Can the editor of THE AMERICAN BOTANIST tell us what use is served by the poisonous species of sumac—*Rhus toxicodendron, Venenata* and *diversiloba?* They are such a serious nuisance to many people by producing irritating eruptions on the skin, that one cannot help wondering why such plants were created. I have recently been interested in reading that full blood Indians are immune from rhus poisoning; and it may be that, as these poisonous species are, I think, peculiar to this continent, Nature intended them and the Indians to dwell together, and that it is the white man's own fault if he gets poisoned! He might have been saved that trouble by remaining in the Old World.—*C. F. Saunders, Pasadana, Calif.*—[The editor expects to have something to say on this subject in another number.]

FERNS IN WELLS.—A well was dug on a bluff four miles west of Dallas and two years later I found a plant of maiden-hair (*Adiantum Capillus-Veneris*) growing in it. It puzzled me at the time for I did not know that such ferns were found in the neighborhood. I have since found two stations; one three miles south of the well, the other six miles east. Another fern was found in a well at Lancaster. Although the plant had no sporangia, I determined it to be the lady fern (*Asplenium filix-fœmina*) but no such fern or any similar to it grows in that locality. The nearest station is about one hundred miles east of Lancaster. So we must conclude that the spores had been carried by the wind into the wells. In this case they certainly had a long way to travel.—*J. Reverchon, Dallas, Texas.* [The editor has noted, in *The Fern Bulletin*, the finding of the oak fern (*Phegopteris Dryopteris*) in a well in the pine barrens of southern New Jersey. This is more than a hundred miles from the nearest known station for the fern. It would be interesting to know whether these are from adventive spores, or whether the spores of these and other species are constantly raining down upon inhospitable regions.]

POISON IVY LEAVES AS AN ANTIDOTE.—I have heard my father, who lived on a farm in his boyhood, so long ago that a scythe was the implement used to cut hay, say that they always ate a leaf of poison ivy before beginning to cut the grass in a field, as a protection against the ivy they might encounter during the day's work.—*Mrs. K. M. Hart, Canandaigua, N. Y.*

APPLICATION OF THE NAME, NUT-GRASS.—Referring to the note in the January number, a Florida correspondent says we have erroneously applied the name of nut-grass to *Cyperus esculentus*. This species is called "chufa," he says, and is grown considerably as hog and poultry food; but *C. rotundus*, the true nut-grass or coca is always regarded as a plant to be destroyed as soon as possible. This is, however, another instance of the indefiniteness of common names. The latest manual of botany calls both species nut-grass and says both are equally troublesome weeds. The editor has never seen either plant living and would be glad to get one or two of the tubers for experiment if any reader can supply them.

IMPROVEMENT OF THE ELDERBERRY.—A writer in the November *Farm and Fireside* mentions a bush of the common elder (*Sanbucus canadensis*) that appeared on his land which bears berries averaging a quarter of an inch in diameter. Four berries laid side by side measured an inch and a quarter, while the seeds were no larger than in ordinary berries. Without doubt this is the beginning of what might become a very desirable fruit if properly handled. In its present state the elderberry is justly valued for use in pies and sauce in winter. Many families annually dry large quantities for this purpose. The process of drying removes a certain rank flavor possessed by the fresh berries, and makes them nearly equal to huckleberries in taste. This new berry would be even more valuable. Those who have gone elderberrying have probably noticed that there are two distinct varieties. One which has green stems and black fruit may be called the typical plant; the other has red stems to the berries and the berries them-

selves have more red in their coloring. This last may be called the forma *rubra*. Some day the systematists will probably make this a distinct variety. In the wild state elderberries differ greatly in size and it is likely that an improved strain of the berries could soon be produced by selection.

An Edible Ornamental.—Probably few of those who cultivate for ornament the plant known as elephant's ear (*Caladium esculentum*) are aware that it is edible. In warmer regions it is grown as a field crop, and frequently known by the name of coco. It bears tubers which can be boiled, roasted or baked like a potato. The young leaves are said to be occasionally used as a pot-herb.

Rose Hips as Food.—It is said that the fruit of the wild rose formed the principal sustenance of the Doukhobors or "Spirit Wrestlers" of western Canada upon their ten days religious pilgrimage across the prairies last November. Having given away all their property in the belief that their wants would be miraculously supplied, they were obliged to depend upon frozen berries and rose hips for food.

What is American Weed?—A writer in *Nature Notes* speaks of some water plant as "American weed" without its scientific designation and we can therefore only guess as to its identity. America has weeds in plenty, as every gardener knows, and many of these we have acquired from Great Britain, but it would certainly be of interest to know what particular vegetable vagabond has become *the* American weed to our English cousins.

Buttercups.—Dearest of all plant names to the child is the *buttercups;* so dear, indeed, that not only all the true buttercups (*Ranunculus*) but the fields of marsh marigolds (*Caltha*) answer to the call. Then around Cincinnati the yellow poppies (*Meconopsis*) are looked upon as late buttercups, and out in Colorado a species of yellow violets (*Nuttallia*) were gold enough to be classed likewise, in fact it is the color and not the shape which appeals to

the child. The trumpet leaved pitcher-plants with their tall royal cups of gold are most fittingly thus named in North Carolina; but all the small pitchers (*Sarracenia*) and the masses of yellow butterworts *in the turpentine belt* are buttercups.—*Mrs. A. E. Goetting, Cincinnati, O.*

Fragrant Grasses.—Most flower lovers are familiar with the pleasant fragrance of the common sweet vernal grass (*Anthoxanthum odoratum*) but it may be new to many that there are other grasses with sufficient fragrance to make them commercially valuable. The lemon grass (*Andropogon schœnanthus*) of the tropics yields an oil with a strong odor of lemon and an allied species (*Andropogon nardus* is the plant from which citronella oil is distilled. The amount of this latter oil imported into the United States amounts to several hundred thousand pounds annually.

An Early Texas Flower.—The earliest bloomer of this section, that I know of, is a small umbelliferous plant. When the season is open, as it generally is in Texas, you may frequently find the blossom opening at Christmas, though as a rule, they appear a month later. The root is a tuber, generally round and frequently as big as a walnut. It consists of a white aromatic substance but I never noticed that any animal eats it. The first flowers are on very short stalks keeping close to the grayish rocky soil in which the plant delights to grow; but as modest and inconspicuous as they are, the bees, if the weather permits, are not long in discovering them and the buzzing of these little workers, helps one to find the flower. In March the plant often has flowers and seeds at the same time and on longer stalks. The foliage has very much the appearance of the leaves of certain *Escholtzias*. I do not know of any common name for it. Pepper-and-salt, a name that is applied to an early umbellifer of the Eastern States would have fit this plant as well, as the purple anthers contrast strongly with the white corolla. Its scientific name is *Phellopterus macrorhizus*.

# Editorial.

In reply to many inquiries we beg to say that no title-pages of THE AMERICAN BOTANIST for the first three volumes have yet been issued, but that they will be as soon as the present rush of business is over, when copies will be mailed to every subscriber.

* * *

It is not customary for THE AMERICAN BOTANIST to publish the commendatory letters it receives, but for once we will suspend the rule long enough to quote as follows from a recent communication: "I am very much obliged to you for what you are saying, now-a-days in the Botanist in regard to the multiplication of species. I think you are quite right in the February number, pages 38 and 39, and trust that you will continue to talk in this way. I think that the reaction is bound to come, and when it does came, the fellows who are multiplying species so rapidly will be quite ashamed of themselves; at least they ought to be." The writer of this is the head of the botanical department of one of our prominent universities, and himself the author of numerous valuable contributions to botany. It is scarcely necessary to say that such endorsement is much appreciated. In this connection and explanatory of the species-making habit it may be interesting to repeat what a prominent New York member of the radical school said to the editor upon the subject. "You see," he said, "we have to claim more than we are entitled to, in order to get what belongs to us when the reaction sets in." Another botanist, an officer of one of our Eastern Botanical Gardens, replied when questioned as to his opinion regarding the validity of certain species of violets. "I cannot split violets with some of the others." When we get beyond certain limits, species-making becomes a mere matter of opinion, when, as in this case, scientists of equal ability are unable to agree.

Small parks in cities are no longer considered merely as ornamental—they have become necessities. The larger a city grows the more need is there for small "breathing places" in the expanse of brick and mortar, where the weary ones may rest a few moments in the shade and where grass and flowers and perhaps a fountain bring something of the country to those who cannot visit it. The larger cities have not infrequently been to great expense in buying land and tearing down buildings to make such open spaces, and smaller cities that expect some day to be larger should take warning in time. Thus far, one possibility in the way of small parks has been overlooked in the grounds surrounding most of our public schools. Allowing plenty of play ground for the children, there is often much space left that, properly planted and provided with seats, would be a godsend to the public. In many cities of some pretentions there is not a single place out of doors in the business district where a tired woman or child can rest. Such a condition of things is not to a city's credit and those who lack park facilities and do not yet feel justified in tearing down buildings to make parks may find in the use of the school grounds a temporary solution of the difficulty. The planting of such grounds would be of additional value since they could then be used in the teaching of nature study which has recently become so popular and would afford opportunities for the cultivation and protection of specimens of our fast disappearing native flora.

* * *

The quotation from an article on nomenclature by C. G. Lloyd, published in this issue, embodies to a considerable extent our own views on the subject. When THE AMERICAN BOTANIST was started we resolved to select for each plant to be mentioned the best known common name and the best known scientific name and this we have continued to do without adding synonyms or "citations." As yet we have not had to explain to any reader what plants have been meant, which would indicate that Mr.

Lloyd's position is well taken. A striking instance of the absurdities fostered by recent rules of nomenclature may be found in the case of the ferns of Eastern America. Of these there are about eighty species and varieties and in the past ten years, the names of no less than forty-three, or more than half, have been changed. Any real reasons for such changes are hard to find. Ostensibly they have been made in the interests of "stability," but as some species have had two or three changes of name in so short a period as ten years it begins to appear that such stability needs a very important prefix to properly designate it.

* * *

To those who have set out to live at least a hundred years, the study of botany is recommended as a valuable aid in the right direction. The longevity of flower lovers is remarkable. One of the editor's correspondents, a young fellow of some eighty summers, is planning a fern-hunting trip to Vermont this year and another, past seventy, has been spending the winter in Europe. Of the four officers of the Fern Chapter, three have passed their sixty-fifth birthday and one of them passed it ten years ago. A correspondent in Canada writes that he has taught botany for more than fifty years but his record is quite put into the shade by another who, at the age of eighty-four, is still teaching botany in a Wisconsin college. Turning to the list of past leaders in botany we find the rule still holds. Linnæus lived to be seventy-one; Lamarck, eighty-five; Muhlenberg, seventy; Thomas Nuttall, seventy-three; Asa Gray, seventy-eight; John Torrey, seventy-seven; Thomas Meehan, seventy-six and Jacob Bigelow, ninety-two. In fact, the further we investigate the matter, the more certain it appears that botanists live longer than the average in other walks of life. Those who have not yet subscribed for THE AMERICAN BOTANIST should do so at once and be prepared to become centenarians.

# THE AMERICAN BOTANIST.

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## VIOLETS.

BY PROF. W. W. BAILEY.

VIOLETS have ever been among the best loved plants. The literature of all northern nations, at least, is suffused with them. The Greeks admired them, and to the gods gave the title, "violet-eyed." It is their simplicity, their modest unassertiveness, that appeals to the heart of humanity. We, indeed, admire the gaudy poppy, but it never suggests such fond recollections of youth, of home, of fatherland. Everywhere the exile takes his violets. The very pansies, whose bright faces fill our spring urns or gardens, are violets, glorified and robed in purple and gold. Their size and beauty is due to the gardener's art. The wild pansy is a very insignificant flower.

The deliciously scented violet, which in the early days of spring, one finds in lawns and elsewhere, is the *Viola odorata* of the old world. It is perfectly hardy here but does not seem aggressive. Our own common blue violet often contends for the same field. It blooms later. None of our natives possess the sweet perfume of the foreign species, though often, when massed, they emit a certain odor.

The earliest of our wild species to put in an appearance is the arrow-leaved, whose foliage, by the way, is very variable. The petals are bearded and the spur short and thick. This is the hollowed out petal that we find in every violet, and which contains the nectar sought by insects. They are, as it were, led to it by converging penciled lines, the meaning of which was first conjectured by Sprengel back in the end of the last century. Our dainty little white violet (*Viola blanda*), shows them well. This

will be found in damp places, as around swamps. The lance-leaved and primrose-leaved violets grow in the same kind of place. Often all three white kinds are found together.

The botanist divides violets into two sections, according to whether or not they have leafy stems. An example of a stemless violet is the sweet white; of a leafy-stemmed one, the yellow violet or the pansy. Perhaps our most beautiful species is the so-called "bird-foot," *Viola pedata*. It derives its name from the digittately parted leaves, quite unlike those of any of our other species. It is found late in the month of April or in early May, in sandy districts. Often a railway bank is literally clothed with the delicate blue or lavender flowers. A variety resembling a pansy, is now and then found. "The two upper petals," says Gray, "are deep violet, and, as it were, velvety." Albinos, of course, occur. The plant thrives by cultivation, increasing in size and color.

We have two species of yellow violet. One of these is pretty common in northern New England and about mountains, like Wachuset. It is the stemless, round leaved form, and, I should think, might be the one celebrated by Bryant in the lines:

"When beechen buds begin to swell,
And woods the blue-bird's warble know,
The yellow violet's modest bell
Peeps from the last year's leaves below."

The other is local rather than rare, and has leafy stems. It is the "downy yellow" of the woods. It often grows in association with the bloodroot and the adder's-tongue.

It is not generally known that violets possess two kinds of flowers. Besides the showy ones we admire, others are produced later in the season at the ends of subterranean runners, and are hidden under the leaves. "These never open nor develop petals, but are fertilized in the bud, and are far more fruitful than ordinary blossoms." Many other flowering plants exhibit this phenomenon.

The violet was among the plants sacred to Venus. In mediæval folk-lore to dream of it denoted advancement in life. A common superstition in the old world associated the blooming violets in the autumn with an approaching epidemic, perhaps as a green Christmas made the fat churchyard. Shakespeare especially loved the "violet blue," to throw a perfume upon which was "wasteful and ridiculous excess." To him the sweet south wind "blows upon a bank of violets." They are worthy to spring from the grave of the gentle Ophelia. In another place they are spoken of as "sweeter than the lids of Juno's eyes." We love to think of the poet strolling on a spring morning, perhaps with fair Anne Hathaway, and plucking the violets in the woods by Avon.

Whenever throughout the plays the flower is introduced, there is presented to our minds at once a scene of peace and beauty. For instance, take the song "In Love's Labor Lost":

"When daisies pied and violets blue,
And lady-smocks all silver white,
And cuckoo-buds of yellow hue
Do paint the meadows with delight."

The violet is beloved, by our English poets as far back as Chaucer. Even the early ballads, the authorship of which is unknown, are sweet with violets. In Percy's "Reliques" we read:

"For violets plucke't, the sweetest showers
Will ne'er make grow again."

and

"The violets that first appear,
By your purple mantles known."

Skipping Milton, who, in his earlier poems had a passion for flowers, and remembered the "glowing violet," and who finds Aurora lying

"On beds of violet blue
And fresh-blown roses washed in dew,"

and coming to the modern poets, of course Wordsworth,

to whom every weed was dear, has not failed to mention the violet:

"A violet by a mossy stone,
Half hidden from the eye,
Fair as a star when only one
Is shining in the sky."

Tennyson, a true poet of nature, speaks of the "violet of his native land," and again:

"In my heart
Spring wakens, too; and my regret
Becomes an April violet."

Of course the exquisite stanza in Maud is recalled in this connection:

"Whenever a March wind sighs
He sets the jeweled print of your feet,
In violets blue as your eyes."

Our own American writers have not neglected the flower of the wayside. Bryant's line on the yellow violet have been referred to. Story sings:

"O, faint, delicious Spring-time violet,
Thine odor, like a key,
Turns noiselessly in memory's wards, to let
A thought of sorrow free."

Hawthorne speaks in his American Notes of a "gush violets along a wood-path." This line is a poem in itself, full of subtle suggestion. It refers to the "bird-foot" violets, which are scattered so bountifully along the sandy ways.

When we think how beautiful these flowers are, we cannot wonder that they are loved by old and young. Is any discovery made in life so enjoyable as that of the first spring violet? It affects us like a blessing. The memories of childhood cluster about it, and we even feel that it may embody the spirit of the loved and lost.

In the meadow the deep, purple violets appear, and where the grass is wet, up peep the tiny white ones in pretty spring bonnets streaked with blue. The violets and the "innocents" are on excellent terms and often grow on the same moist and sunny bank. Near them the

cinque-foil shows its golden star, and the early everlasting its white and scurfy stem.

There are a good many kinds of violets, varying in foliage, size of flowers, length of spur and degree of odor. The type, however, is pronounced. No one ever mistakes a violet for anything else.

*Providence, R. I.*

## THE CHILICOTHE VINE.

BY MRS. M. F. BRADSHAW.

IF we have an early rain up comes the chilicothe (*Micrampelis macrocarpa*); if we do not, here it is just the same. Early in January or even before Christmas, a drive in the canon or along the foothills will not be without flowers no matter how forbidding the season may have been.

The chilicothe is rambling over the bushes and catching at the lower branches of the trees, lovely in its new, pale-green dress, profusely embroidered in white. It is a marvel how such lengths of vine can have grown so soon. In contrast to the rest of the plants, still in their last year's faded garments, or now and then one poor thing quite nude, how charming and exquisite it is.

The racemes of blossoms are many inches, perhaps a foot long, delicate, airy and graceful; we gather our hands full and a rare bouquet they are with here and there a spray of leaves and tendrils. The botanist soon observes that these racemes are only staminate flowers and that the pistillate ones stand singly in the axils of the leaves below, and not many of them either. Some of the older plants show the bur or cucumber and they may be in all stages of growth, from the ovary crowned by the flower to the full sized fruit, two inches or more in diameter.

It is not so easy to find out why this plant alone has grown and bloomed; but if you dig to the root your problem is solved for you will find it simply immense. Shaped like a turnip and sometimes as large as a tub,

food and water are stored up for the early plant, making it quite independent of rains. There are many devices among the plants in this country of long dry seasons for getting on in life. This "big root" is one and some months ago I told you about the turkey weed which takes the driest and hottest time of the year, and arranges all its parts to gain its livelihood when most plants would die. It has a short thread for a root hardy sufficing it to cling to the ground, but an intricate covering of hairs to catch and guide the dew into the pores of its leaves. While the chilicothe on the contrary is entirely dependent on its root; so also is its cousin *Cucurbita fœtidissima* "mock orange," a postrate vine bearing large yellow flowers looking like pumpkin blossoms and in the fall a plentiful crop of yellow gourds the size of oranges.

This plant comes on late in summer, growing rank and fast and perfectly secure from molestation by man or beast. Its leaves are large and velvety, its flowers fine, but the whole plant gives out such an atrocions odor when touched, it is left to its own affairs entirely. I have never yet found courage to analyze it, content to take the word of some braver student who has.

*Orange, Cal.*

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## BOTANY FOR BEGINNERS.—I.

ALTHOUGH we now have numerous books for popularizing the study of our wild flowers and an equal number of manuals by the use of which, under the guidance of a teacher, one may become familiar with the science of plants, there is still to be heard the complaint from the beginner working alone that he makes progress but slowly. One of his chief grievances is the excessive use of technical terms; even the popular works bristle with them. The fact is that botany, like all other sciences, is first of all exact, and the terms in use convey such definite ideas that the botanist finds it much easier to use them when writing for the beginner, than to select other terms more readily understood. The writer believes, however,

that botany can be taught without a large amount of technical language and has prepared this series with this special end in view. Technical terms will be used only when they cannot be avoided.

In botanical works it is customary to begin with low forms of life like the algæ and proceed upward to the more highly specialized flowering plants and in treating of the latter to follow the sequence of root, stem, leaves, flowers and fruit. Since this often has the effect of tiring the young student before he arrives at the more interesting parts, we will cut all these rules for the present and plunge at once into a discussion of

## THE FLOWER IN GENERAL.

Excepting the herb-gatherer and the horticulturist, it may be said that the world's interest in botany centers in the flowers of plants. So pronounced is this that the word flower is often popularly used to indicate not only the blossom but the plant that bears it. In botany, of course, the flower is only that part of the plant that produces the seed or fruit. Not so very long ago it was believed that the color, form and fragrance of flowers was designed solely for the pleasure of mankind; but the case has gradually been proven otherwise and we now know that certain insects, rather than ourselves, are the individuals that plants strive to please. It is, however, only another indication of the wonderful harmony of creation that man should find so much pleasure in objects not intended primarily for him.

At the beginning we may ask what flowers are for. Their most obvious office is that of setting seed and so perpetuating the species as well as extending its dominion; for seeds can travel much farther and faster than ordinary plants can. In this struggle for territory the strongest and most vigorous seeds win; and such seeds are only produced in flowers that have been crossed with flowers from other plants of the same species. So the flower is not alone for producing seed, but for affording a chance to cross with other plants of the same species and

thus keeping up the vigor of the race. All our common plants except the ferns and their allies bear flowers at some period of their life cycle.

### PLAN OF THE FLOWER.

A flower is simply a modified branch and all the floral organs are transformed leaves, or more properly, are produced from what might otherwise have been leaves. This at first seems rather difficult to believe, but Nature, herself, has given us many hints in the matter. Thus in cercertain geraniums (fig. 1.) the central part of the flower, which we may regard as the end of the branch, continues to grow and to produce a new flower or even a truss of flowers rising out of the old ones. Apples and pears have been found with a leafy shoot growing out of the "blossom end" showing very clearly that the parts of the flower are in the nature of modified leaves. That singular object, the green rose, is like other roses in the bud, but when it opens, it shows that all its petals have reverted to small green leaves.

FIG. 1.

Upon examining some simple flower such as that of the stone-crop (fig. 2) we find it consists of four kinds of organs. Beginning on the side next the stem there is a circle of five green leaf-like objects, the *sepals* and collectively called the *calyx*. Next is a circle of five colored leaflets, the *petals* which form the *corolla*. Then comes a circle of thread-like organs with little knobs on the ends, the *stamens*; and last, in the very centre of the flower certain bottle-

FIG. 2.
Flower of Stonecrop, enlarged.

shaped bodies, the *pistils*. These organs always have the same relative position. The pistils are always in the centre of the flower, the sepals on the outside and the petals and stamens between. The terms which I have just italicised are necessary for even the beginner to know but they are all in such common use that they are doubtless already familiar.

In the stone-crop flower these different organs are so close together that most of its resemblance to a branch is lost but, in the blossom of the spider-flower (*Cleome*, fig. 3) the parts are much more leaf-like in arrangement. Here we see a circle of four small sepals, and above it the four petals each on a stalk while the single pistil in the centre is raised above them all.

FIG. 3.

Every complete flower has these four kinds of organs but not all flowers are complete. The two kinds necessary to the plant are the stamens and pistils. In the production of seed, it is necessary that some of the yellow dust or *pollen* contained in the stamens should fall upon the pistil and stimulate their embryo seeds into growth. Otherwise no seed would result. Thus the stamens and pistils, being the only organs *essential* to the work of the flower are called the *essential organs*. The sepals and petals have no such important offices to fill and are absent from the flowers of many species. When present, their functions are principally the protection of the essential organs from cold, wet and mechanical injury and the attraction and guidance of the insects that assist in transferring the pollen from stamen to pistil.

Leaving out of consideration for the present, flowers of irregular shape, it will be found upon counting the parts of the flower that there is not much variation from cer-

tain definite numbers and that five and three are prime favorites. In the five-parted flowers there is normally a calyx of five sepals, a corolla of five petals, a set of five stamens and another of five pistils. When the number in any circle varies it will be found to be some multiple of five. The pistils are frequently less than five but such cases are due to a consolidation of the original five. Examples of five-parted flowers may be found is the apple, peach, cherry, buttercup, cinquefoil, bramble, mallow, phlox, pink and saxifrage. Such blossoms are usually associated with plants having broad and net veined leaves.

In the three-parted flowers, sepals, petals, stamens and pistils are found is sets of three or some multiple of this number. An excellent example is found in the trillium (fig. 4) which has three sepals, three petals, six stamens and one pistil though the latter shows very plainly that it is a consolidation of three. The three-parted flowers are usually found on lily-like plants with narrow, parallel-veined leaves. Examples may be found in the lily, crocus, amaryllis, tulip, iris, onion, and water-plantain. In most of these there appear to be six petals of the same color and no sepals, but a close examination will reveal the fact that the three that were outside in the bud are slightly broader and thicker than the rest and so for our purpose may just as well be called sepals. The six colored divisions of three-parted flowers are usually called collectively the *perianth.*

FIG. 4.

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MAPLE SUGAR.—More than fifty million pounds of sugar and three million gallons of maple syrup are produced annually in the maple forests of the northern United States, according to *Forestry and Irrigation.* Nearly one-fifth of all the granulated sugar made in the United States is obtained from our woodlands.

# WHAT IS AMERICAN WEED?

BY ROBERT BLIGHT.

IT is *Anacharis alsinastrum*, and is commonly spoken of in Great Britain as "American weed" and "Canadian weed." I have frequently heard both names. If Americans feel any bitterness about the "English sparrow," they have the satisfaction that they have supplied England with as troublesome a pest in this water plant. The Treasury of Botany says, (Sub. *Anacharis*), "An American plant, which made its appearance in several remote parts of Britain almost simultaneously about the middle of the nineteenth century. How it was introduced is unknown, and it is equally a mystery by what means it traversed the wide tracts of country which separate the various stations in which it first appeared; for, as it is dicœcious, and pistilliferous plants alone have found their way to this country, it perfects no seeds. It easily propagates itself from a small portion either of the stalk or root, and is of wonderfully rapid growth; hence it has in many instances destroyed the beauty of ornamental pieces of water, impaired navigation in not a few inland canals, and interferes with the working of water mills, by choking the outlets of reservoirs, especially toward the close of summer, when its debris is often brought down by the current in large quantities. Great efforts have been made to eradicate it in various places, but with imperfect success. It is greedily eaten by swans and some other waterbirds; but even this service is not without its disadvantages, since portions of the stem, torn off but not consumed by these seeming allies, are carried away by the current, and transplanted elsewhere."

H. Noel Humphreys, in "Ocean and River Gardens," 1857, is more explicit: "It has been called the New Water Weed, or, by some, Water Thyme, from its slight resemblance to plants of that class, and its history is somewhat interesting. It was unknown in England so lately as 1842, when the late Dr. George Johnston, of Berwick-up-

on-Tweed, noticed it for the first time in a pond, at Dunse Castle, in the month of July of that year. Specimens were sent to the Cambridge Botanic Gardens, where it grew far too abundantly, and the refuse, which was from thence thrown into the Cam, has thriven with such extraordinary luxuriance that it threatens to form a serious impediment to the navigation of that stream. From Kew Gardens it has, in like manner, escaped into the Thames, where it is already one of the most abundant and troublesome of the water-weeds; while in some of our canals it positively threatens to put a stop to the navigation entirely."

*Morristown, Pa.*

[This plant is our common ditch moss and also goes by the names of *Udora Canadensis* and *Anacharis Canadensis*. It does not appear to be troublesome in America.—Ed.]

## AMONG TEXAS FERNS.

BY J. M. FETHEROLF.

THE writer has roamed the woods of eastern Texas day after day during the past winter and accordingly had an opportunity of meeting a number of old fern-friends and at the same time becoming acquainted with a number of new ones most of which have never been reported from this region before. It is my purpose in this article not only to report those found but at the same time to state such facts about their occurrance and collection as may be of interest to the student of these most interesting plants.

Silsbee, Hardin County, was our first station. After establishing camp (Oct. 15, 1902) a short excursion was made to prospect on what the country might have in store. Naturally we betook ourselves to the narrow strip of hardwood land along the small stream near by where plant life seemed more varied than on the monotonous piney plains. Of course old friends greet us first. We were glad to welcome the flowering fern (*Osmunda regalis*) and the cinnamon fern (*O. cinnamomea*), but—behold!

among them a stranger, the chain fern (*Woodwardia Virginica*), whom we did not at once recognize as differing from *Osmunda cinnamomea*. The first two, however, are waning while the latter still sends up new fronds at intervals as the stout root-stock creeps along the soft stream bottom.

While we lingered in silent satisfaction over our success, the graceful fronds of another fern, although not seen before were at once recognized as those of the gray polypody (*Polypodium polypodoides*) by its peculiar tree-trunk habitat. This fern proves to be rather common, especially in the moist river bottoms where it often grows sixty feet from the ground. It is occasionally seen upon cypresses and magnolias, but seems to have a decided predilection for oaks and gums on the mossy horizontal limbs of which it is most successful in establishing and maintaining an aerial colony. Often the polypod and the long moss (*Tillandsia usneoides*) share a tree crown among them; the former embracing the larger limbs, the latter dangling from the smaller branches.

Three weeks later, Dec. 7th, in a rather springy site among oaks, beeches and magnolias, another treasure, the narrow-leaved chain fern (*Woodwardia areolata*) was found in company with the lady fern (*Athryium felix-fœmina*) and the rather common Christmas fern (*Polystichum acrostichoides*). Farther along the same stream this fern associates with *Woodwardia Virginica* and *Osmunda regalis*, always, however, keeping just out of reach of the water which the other two prefer. Growing in deep humus at the edge of the same woods, a single plant of *Dryopteris patens* was collected.

Some of the ferns here enumerated were discovered by accident rather than by intention. For a first instance: on December 11th, while engaged in determining the number of newly germinated longleaf pine seedlings on a plot two rods square, and while thus on all fours searching among the dead grass, *Ophiglossum pusillum* was found in abundance. Some of the plants were just emerging

from the sandy soil; others were fruiting. The same plant was subsequently observed at several stations in Newton County. In the writer's opinion it is not especially rare in this section. This fern with *Pteridium Aquilinum pseudocaudatum*, probably the most common of all, are the only ones found in the grassy piney woods.

We are accustomed to find the ebony spleenwort (*Asplenium platyneuron*) on rocky slopes in old pastures or open woods. Here (Newton County, January 7th) the same plant was found in a level, sandy district growing under a dense evergreen canopy of holly, red bay, wild peach and oaks.

The thick evergreen fronds of *Dryopteris floridanum* were discovered (January 20, 1903) near Trotti, same county. Here they are growing in deep, moist, moss-covered humus, close to the border of a small branch and under cover of an almost impenetrable thicket of *Ilex lucidula*. In this particular locality they are fairly abundant; elsewhere, however, none were seen. The rattle-snake fern (*Botrychium obliquum*) was seen occasionally during the winter, always growing in the very best soil the region affords.

The author considers himself lucky in being able to report so many species from this sandy, poorly diversified country. While it is still possible to find other species at other seasons of the year, the thirteen species here enumerated doubtless constitute the greater number of all the ferns growing in the region.

*Bureau of Forestry, Washington, D. C.*

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## SPECIES OR VARIETIES?

BY W. C. STEELE.

THE editorials in the February number on subdivision of species, reminds me of some of my own experiences which may be of interest to the readers of THE AMERICAN BOTANIST. I came to Florida nearly twenty years ago and soon found that Gray's Manual and Wood's Class

Book were of very little use here, so I procured a copy of Chapman's Flora of the Southern United States.

Soon after, I got into a correspondence with the author, Dr. A. W. Chapman, which was kept up at intervals until his death. In the course of this correspondence the question as to whether *Zephyranthes Treatea* was a good species or only a subvariety of *Z. Atamasco* was discussed. He always expressed the opinion that it was not a distinct species.

*Z. Treatea* grows abundantly in this part of Florida. Dr. Chapman sent me some bulbs which he wrote were the typical *Z. Atamasco*. These have now been growing in my flower garden for over fifteen years, blooming every year and no botanist in the world could distinguish the unopened flower buds, the open flowers or the ripening seed stalks and pods from those of *Z. Treatea* found by the thousand near by. There is absolutely no difference between the two except in the leaves. More than that, soon after I received the bulbs from Dr. Chapman being at the time connected with the *Florida Dispatch* I asked the readers to send me specimens of the "Easter lily" as these flowers are called in Florida. I received some from several different parts of the state. When growing I found that I had bulbs with leaves varying from the nearly round form of *Z. Treatea* up through different widths to the full breadth of the typical *Z. Atamasco*. The flowers of all these forms were exactly alike and like *Z. Atamasco*.

In the case of the *Habenarias*, Gray and Wood in their botanies describe *ciliaris* and *blephariglottis* as distinct species. Dr. Chapman, however, gives *blephariglottis* as a subvariety of *ciliaris*. Some years ago I found positive proof that he is correct. I found within a mile or two plants bearing the rich orange colored blossoms of *H. ciliaris* and others with the pure white of *H. blephariglottis*. But more than this I found other plants of all possible shades between, not one or two but dozens of them, some just creamy white, others lemon yellow in fact a half dozen varying shades between orange and pure white. I

wrote an account of this to the late Thomas Meehan and he seemed to be much interested in my notes on the discovery I had made. I have not for many years had time in the blooming season to look up the matter to see if those varying forms are still there but have no doubt some could yet be found.

*Switzerland, Florida.*

## Note and Comment.

WANTED.—Short notes of interest to the general botanist are always in demand for this department. Our readers are invited to make this the place of publication for their botanical items.

CHAPTALIA TOMENTOSA.—*The Florida Agriculturist* mentions this plant as one of the early flowers to be found in the "flat woods" of that part of the world. It is one of the composites with white daisy-like flowers that have the peculiar habit—for composites—of nodding until ready to open. The ripened seed produce a globular head resembling that of the dandelion. It is suggested that this would be a good species for cultivating elsewhere.

FRUIT OF RED BANEBERRY POISONOUS.—The European baneberry (*Actæa spicata*) is reputed to be poisonous but few experiments have yet been made with the two forms which grow in America. In *Rhodora* for March, Alice E. Bacon notes that the red baneberry (*Actæa spicata rubra*), a common plant of the northern states, contains a powerful poison, a dozen of the berries being probably enough for a fatal dose. Six berries at one dose caused an intense burning at the stomach, greatly increased pulse, dizziness, inability to talk coherently, and a visual disturbance that caused a seeming display of blue objects of all sizes and tints. There were also sharp pains in various parts of the body. The berries have a very unpleasant taste and are therefore not likely to be eaten, but it is well to remember their dangerous character.

ROSE JAM AND JELLY.—Roses are grown by the acre in Bulgaria for the purpose alike of making rose jam, rose dessert jelly and the famous perfume, attar of roses.—*Gardening World.*

PLANTS WANTED.—Although the ironweed (*Vernonia noveboracensis*) is one of the commonest of plants in the greater part of eastern America, not a specimen has been found in the Susquehanna Valley in southern New York. The editor of this journal has tried to raise it from seed without success, and would be glad to get small living plants for trial. Among other plants desired for his wild garden are pleurisy root (*Asclepias tuberosa*), marsh mallow and species of *Liatris*. He will be glad to exchange plants of his own region for those here mentioned.

PLANTS USED FOR FLAVORING.—Members of the Gray Botanical Chapter have recently been noting the use of unusual plants for flavors in culinary matters. Geranium leaves are sometimes boiled with the sugar to flavor crab-apple jelly, sassafras leaves are used in winter soup, and sassafras bark has been used to flavor apple sauce. In the south the young tips of the sassafras are used to flavor the dish known as gumbo. To this we add that sassafras tea made from the bark of the roots is still greatly valued as a blood purifier, and used in many families every spring.

THE HOLIDAYS AND PLANT DESTRUCTION.—The custom of decorating our homes and churches during the Christmas holidays is responsible for a vast amount of plant destruction, and as this custom seems to be spreading to other holidays, those interested in plant protection may well turn their attention to it. Just before Easter the florists journals were full of advertisements of various wildings for sale, the principal plants and their prices given as follows, *Galax* leaves, 75 cents per 1000; *Leucothœ* sprays, $1. per 100; southern wild smilax, $4. per case; laurel festooning, 4 cents per yard; pine festooning, 4 cents per yard; princes pine [*Lycopodium?*], $5. per 100 pounds.

NEW METHOD OF POLLINATION.—According to *Indian Planting and Gardening* an English gardener has hit upon a new way of cross-pollenating plants. Finding a camel's hair brush wasteful of pollen, he tried a stick of sealing wax and found that when this was rubbed briskly on his coat sleeve as for an electrical experiment and then presented to the flower, the pollen at once flew to it and adhered, allowing every particle to be used.

ORIGIN OF CULTIVATED PLANTS.—All plants whatever —orchid, palm, lily, pelargonium or fern—are found absolutely wild on some portions of the world's surface somewhere or other in Nature's great wild garden. The most beautiful of all our hothouse and greenhouse or conservatory plants originally existed wild in forests and prairie or in the rivers and lakes or on the mountains and could be collected without let or hindrance by any traveller who cared to do so.—*Gardening World.*

WEEDS.—The statement that a weed is only a plant out of place is doubtless correct. Often the "weed" is carefully cultivated in other places. A singular instance of this is given by a writer in *The Gardening World* who says that visiting a friend in Singapore who had just cleared up some jungle for a residence, he found him greatly troubled by weeds, which persisted in springing up in his lawn and flower beds. In this case the most troublesome were the native pitcher plant (*Nepenthes rafflesiana*) and several palms and ferns!

ST. JOHN'S-WORT IN WINTER.—I have often gathered the winter shoots of the common St. John's-wort (*Hypericum perforatum*) for decorative purposes. They are long and slender, thickly crowded with green leaves, and very pretty for vases and table decoration. They grow flat on the ground, often twelve or fifteen inches long and so unlike the upright summer growth of the plant that one may well be puzzled when coming upon a mat of these prostrate branches for the first time, to know the familiar weed in its winter garb.—*Mrs. Frances Wilson Starmer in report to Gray Botanical Chapter.*

NAMING PLANTS FROM THE SEEDS.—In a recent publication of the Field Columbian Museum, on the flora of Yucatan, the author, C. F. Millspaugh, asserts that the seeds of plants furnish excellent characters from which to identify the species. The plants of Yucatan, it appears, are prone to vary in form, and he was obliged to fall back upon the shape and markings of the seeds to be sure of his identifications. The publication contains illustrations of each species listed, in most cases presenting a cross section of the seed and a magnified portion of the outer surface showing the characteristic markings. These latter exhibit an astonishing number of designs, and form an interesting addition to our knowledge of the plants. A study of the seeds of North American plants that are closely related would doubtless bring out many important points.

THE CROCUS.—Perhaps we would love this favorite of March more than we do if it were a native wilding. But there is no American crocus. It is found in many parts of Europe, such as Greece, Hungary, Turkey, Italy the Maritime Alps, the Pyranees, the Carpathians, Dalmatia as well as many parts of Asia. At present sixty-six species are known to botanists and many crosses have been made between them. The crocus has been cultivated for more than 300 years. All, or nearly all, of this large family are hardy and simple and unexacting in their requirements needing only ordinary soil and the scant warmth of March to bring them to perfection. This applies to the spring blooming species. Those that bloom very late in fall and in the winter are not well adapted to our gardens and need the protection of a cold frame. At least forty-two of the species known flower in autumn or in the early winter in their native haunts.—*Danske Dandridge in Gardening.*

# Editorial.

Readers will notice that this issue contains four more pages than usual, but we hasten to say that this is but a temporary increase made principally for the editor's pleasure. However, the number will show what the journal will be like when the next enlargement, which is now about due, is made. As we have repeatedly stated, the number of pages will increase only as the subscription list warrants. If you speak a good word for the magazine, it results in more reading matter for yourself. Ask your friend—the one who most frequently botanizes with you—to subscribe. If subscribers double our subscription list, we will promptly double the number of pages. Don't you care enough about a forty-page magazine to hustle a little for it?

* * *

No doubt the correspondent who asks, in the March number of this magazine, why the poisonous species of sumac (*Rhus*) were created, voices a query that often occurs to others when contemplating plants that human experience has pronounced noxious, and as this query so seldom receives an adequate reply, the editor is moved to express his own views on the subject in the hope of bringing out the opinions of others. Had such a question been asked a few years ago, we would have been assured that the poison of the sumac is a feature in the plants evolution designed to protect it from its foes, but the facts do not bear out this explanation. We call the plant poison ivy because it poisons *us* but the cow eats it with impunity. The nettle which is so irritating to us is apparently a choice tid-bit for the soft-bodied larva of the comma butterfly (*Grapta*) while the worm that is to become the future sphynx-moth is a striking illustration of the fact that chewing tobacco is not bad for the health—at least

for his health. From this it appears that we cannot pronounce upon the utility of any plant structure considered solely from mankind's standpoint.

* * *

Scientists are accustomed to account for any special features of plants upon the theory of evolution. Thus spines, thorns and prickles are supposed to protect their possessors from animals that would otherwise devour them. The ferns, however, strongly contradict this, for the tree ferns of the tropics, with great coarse fronds high in air have their trunks thickly set with sharp thorns, while the tender herbaceous species on the earth have no such protection. Possibly the spines and prickles of the cactus protect its succulent body from thirsty herbivores, but if one examines the vegetation in its vicinity it will be found that other plants have similar armor though they would scarcely tempt a browsing animal if guiltless of such defenses. Is the foliage of the rose so tempting that it requires prickles to defend it, while its cousin, the spiræa fights life's battles unarmed? The more we study facts of this kind the more certain it appears that many plant structures once thought necessary to the plant's success in the struggle for existence, are more properly considered as matters by the way.

* * *

The same is undoubtedly true of plant-secretions. Starch and similar elements are stored up by plants for themselves or for their seedlings, but there are other substances that plants produce only to get rid of. In manufacturing elements for their own use, various by-products are thrown off that are useless. In the partridge-pea and the bracken we may find these products excreted through glands. Other plants, lacking glands, store them up in their tissues. That these secretions are often harmful to the plant is shown by the fact that quinine will poison the Cinchona tree that produces it, and aconite and belladonna have similar effects upon the plants from which they are obtained.

In the light of the foregoing facts, and many others which lack of space forbids discussing here, it seems only reasonable to conclude that along with the development that has made plants successful in the struggle for existence there has gone another development of structures and products that are useless or perhaps harmful to the plant, but produced of necessity. It is the editor's own opinion that the poisonous qualities of the sumac were not evolved as a means of defense, but possibly arose as the outcome of various processes in the plant economy. Similarly, if the nettle has reached its present position by reason of its stinging hairs, it is difficult to understand why it did not develope hairs that make life uncomfortable for the larva that feed upon it, while it was about it.

* * *

That plants vary and have varied since the beginning of time all students are willing to admit; but *why* plants vary is a question to which no one seems to have attempted an answer. The structure of a grass, for instance, is admirably adapted to its position in life, but why hundreds of forms of grasses? Some, to be sure, are due to different environments, but there are many forms inhabiting the same area. It would probably be considered the wildest speculation to suggest that the way in which various plants have worked out the problem of assimilation and excretion has played a most important part in this matter, but as we already know that these processes have had some effect upon plant structures, such as glands and the like, is it not possible that these effects may prove to be of still greater importance?

* * *

With the opening of the blooming season, it must exasperate the average plant protector, to see great bunches of arbutus, azalia, columbine, trillium, lupine, etc., being brought back from outings in the country by heedless botanizers, or hawked about the city streets. Without doubt the laws against trespass are sufficient to protect these plants, provided the lands upon which they grow belong

to persons interested in their protection, but as a remedy against uprooting such species from other lands, it is suggested that legislation should be secured forbidding the collection of certain plants anywhere unless permission of the owner of the land is secured. Our various plant protection societies could profitably draft such bills, present them to the different state legislatures and urge their passage. Only those plants in great need of protection should be included in such bills. Otherwise they would probably be defeated; for the people feel that they have a right to the flowers in wild lands.

## BOOKS AND WRITERS.

*Indian Gardening and Planting* of Calcutta, though hailing from a point far beyond what are usually considered centers for such things, is one of the most practical and instructive of the gardening publications that come to this office, a fact which we have indicated by the frequency with which we quote from it. It began its twelfth volume in January, last, much improved in appearance and with a transposition in its title which makes the planting section the leader. It has our best wishes for the success it so well merits.

We have been accustomed to recommend Harriet L. Keeler's "Native Trees" to the general reader, as the best tree-book for his purpose to be found in America, and apparently others have been of the same mind for more than ten thousand copies have been sold in a little less than three years. Now comes "Our Northern Shrubs" by the same author which is worthy of an equally cordial reception. It is planned upon the same lines as her first book and consists of one or more photographs of each species, with scientific descriptions arranged under such heads as bark, wood, leaves, calyx, corolla, stamens, fruit, range, etc., followed by matter of more or less popular character. The photographs are excellent, and the author most excels in the thorough knowledge of her subject displayed. One takes up the book to find out about a plant and after

the information is secured reads on about others, attracted by the text. Shrubs lend themselves so well to decorative planting that in consequence we have a great number of shrubs in cultivation that are not native. It is pleasing to find that the book includes these, this fact adding largely to its value. It is a twelvemo and contains five hundred pages. (New York, Chas. Scribner's Sons, $2.00 net.)

"Among Green Trees," by Julia Ellen Rogers is a book that treats of all sides of the subject. The nature-study side deals with various ecological problems; the physiological side with the processes of growth and reproduction; the practical side gives clear directions for planting and pruning trees; and the systematic side describes about 125 species of native trees with special attention to their individual characteristics. There are a large number of illustrations mostly from photographs, those illustrating specimen trees being unusually good. (Chicago, A. W. Mumford, $3.00.)

Dr. Henry Kraemer, professer of Botany and Pharmacognosy in the Philadelphia College of Pharmacy has recently issued an attractive volume under the title of "A Course in Botany and Pharmacognosy." The author states that the book was written to meet his own needs in teaching the subjects indicated, hence it is likely to be of value to all others in the same line. The presentation of the botanical part differs in many respects from the usual treatment, much attention being given to the cell and its contents. The special feature of the book is, of course, to be found in the treatment of the drugs. This is divided into two sections. In the one devoted to crude vegetable drugs, each drug is described, its source indicated and its constituents given. If the drug is often adulterated the adulterants are named. The allied plants from which similar drugs may be obtained are noted. In the section of powdered drugs, keys are given for their identification and the microscopical appearance of each is described. This book will be of great value to such readers as are interested in the various properties of our plants. (Philadelphia, Henry Kraemer, $3.50.)

# THE AMERICAN BOTANIST.

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## LYCOPODIUMS OF THE GREEN MOUNTAINS.

BY FRANK DOBBINS.

DURING the past summer, while spending some time among the Green Mountains in southern Vermont my attention was particularly attracted to the group of cryptogamous plants known as the *Lycopodiums*. There are several species to be found in that region, some of them being quite abundant. To come upon a bed of these plants in the depths of the forest or on the bank of a mountain torrent, where they cover the ground like a rich green carpet, is a delightful experience to the lover of nature. They are not confined, however, to the woods. The finest bed of *Lycopodium complanatum* or trailing Christmas-green that I ever saw was in the open along a wall bordering an old orchard. Although this plant is often sterile and a fruiting portion not always easily found, here the fertile spikes were very much in evidence.

Perhaps the most beautiful member of this group of plants is *Lycopodium clavatum* or running pine. Its long stems creep over the ground often for yards. It is of the most vivid green and is very effective when used in decoration. This and the preceeding species furnish the Lycopodium powder or vegetable sulphur often used for stage effects. Perhaps we should state that this powder is the minute spores which in these two species are produced in great abundance. When dry it is highly inflamable.

The plants of *Lycopodium obscurum* another species to be found in the same localities, very much resemble a miniature evergreen tree. This is known as the ground pine and has less of the running or trailing character than those just mentioned.

*Lycopodium lucidulum* has a curious feature that makes it easy of identification. The leaves grow in two series, a longer series alternating with a shorter. Each series extends about three-fourths of an inch on the stem, and the difference in the length of the leaves is quite noticeable. This plant often propagates itself by means of gemmæ which fall to the ground where they become new plants.

The stiff club moss (*Lycopodium annotinum*) is rarer than the others in the region of which I am speaking and is of itself much less beautiful. An allied plant which was once classed as a *Lycopodium* but which is now placed in another genus is *Selaginella rupestris*. This I found growing in great profusion in the clefts of rocks on some of the higher hills. All of these plants are of wide range, being found from Newfoundland to North Carolina, and a careful study of them will richly repay the student of nature.

*Shushan, N. Y.*

## A NEW FERN FROM BERMUDA.

BY B. D. GILBERT.

WHEN I first gathered this fern in Bermuda I saw that it could not be *Asplenium trichomanes* proper, as it had been called up to that time, so I listed it as *A. trichomanes* var. *majus* Mett. Afterward it seemed to me to come nearer *A. anceps* and I so published it, provisionally, but without having seen Florida specimens. None of my correspondents, not even the Gray Herbarium, seemed to possess the Florida form. Last March, in order to satisfy myself in regard to it, I went to Ocala, Florida, from which point Captain J. Donnell Smith sent specimens to Prof. D. C. Eaton, and there I collected the fern. I found that it was not *A. anceps*, the pinnæ being quite different from that in shape. At first I was inclined to think it might be *A. resiliens* but frequent examination and comparison have led me to believe that it is a new species and as such I have described it.

ASPLENIUM MUTICUM Sp. Nov.

Roots fibrous; rootstock covered with fine, black, sharply lanceolate scales; stipes clustered, black or eben-

eous, 1½ to 7 cm. long, scarious edged as is also the rachis, strong and stiff; frond including stipe 12 to 38 cm. long, 1 to 2 cm. wide, pinnate with 25 to 40 pairs of pinnæ; pinnæ close or distant, opposite above, alternate or opposite below, more distant and decreasing to ½ the size of the middle ones, slightly stalked or sessile for ⅔ the length from tip of frond, stalked at lower interior corner, truncate at base then gradually changing attachment to middle of base and becoming more or less triangular; pinnæ above these, oblong, bluntly rounded at end, crenate on upper edge and around upper end; veins simple except the lowest upper vein which runs into the slight auricle and is once or twice forked; sori regular or scattered even on the same frond, one in the auricle and on each vein when regular, oblique close to midrib; indusiun pale, edge irregular.

Habitat: Bermuda; Ocala, Florida.

The affiliation of this species is with *A. resiliens* rather than with *A. trichomanes*. In fact, I am not certain that some of the specimens which have been distributed as *A. parvulum* (=*resiliens*) are not *A. muticum*.

*Clayville, N. Y.*

## POISON IVY AND ITS EFFECTS.

BY ANGIE M. RYON.

DURING my younger days I would handle this plant with impunity often gathering it in October for its bright coloring and never fearing it, as it never, at any time of the year, poisoned me. For several years I did not live where I met with it so I can not tell at what time this immunity ceased. I only know that for the last few years I cannot touch it in the slightest degree without days and often weeks of acute suffering from the intolerable itching and burning pain which accompanies this form of poisoning. I avoid it as I would a pestilence, never touching it, and if possible, never walking over it during its flowering season as the pollen is evidently poisonous to me. My first experience was a terrible one. The first beginning be-

ing a tiny spot on the little finger which had accidentally touched a leaf of poison ivy while I was digging plants of Virginia snake root (*Aristolochia Serpentaria*). I used as a lotion New England rum and water equal parts, but it was fully two months ere I recovered from the direful effects of this poisoning. It seemed to poison the whole system. The next year in July (my previous attack was in September) I suffered another siege of a similar nature. This was less protracted but the rum applications were of little if any good and I used common cooking soda with immediate benefit. I also found great relief by using a little muslin bag of the soda, wetting it with cold water and applying it to the poisoned hands, the blisters not being broken.

I wonder if other observers have noticed with what evident relish horses and cattle at times eat the leaves off this noxious plant? I occasionally see it and though I cannot forbear a shudder at the sight, I have failed to see any harm result from it. Perhaps it would not hurt me if I were bold enough to try it, but I freely confess I am not. The mucous membrance cannot always be proof against its effects for during my past experiences from the touching of it, the roof of my mouth had after a while itching blisters like those of my hands. It is very abundant all about this section often growing rankly upon the walls and fences, bordering our country roads for miles. It *looks* well for it covers walls and fences with bright green, which in October turns to brilliant hues, but to me at least it is a constant menace and source of dread.

*New London, Conn.*

[There seems to be numerous instances of people at first immune to the poison of this plant and later losing such immunity. The editor, who once cultivated a case of ivy poisoning upon his own hands for the sake of experiment, found that common laundry soap rubbed over the affected parts was very efficacious in allaying the itching. The old fashioned remedy was "soft" soap, but this commodity appears to have nearly gone out of existence.—Ed.]

# BOTANY FOR BEGINNERS—II.

## THE ESSENTIAL ORGANS.

The essential organs of the flower—the stamens and pistils—are the very ones that to the casual observer may seem least essential. From the standpoint of beauty, at least, the sepals and petals are of most importance; but use and not beauty is the plant's first requirement and all the delicate hues and varied modifications of petal and sepal are but so many aids to those insignificant looking organs in the centre of the flower. The contents of stamen and pistil must be joined or no fruit will be set, and in consequence the flower will fail to accomplish the very object for which it was produced.

### THE PISTIL.

The pistils always occupy the centre of the flower, excepting in the case of a few staminate blossoms when no pistils are present. A typical pistil such as that of the cherry (fig. 5, *a.*) is a bottle-shaped organ with three well defined regions. The enlarged lower part, containing the embryo seeds, is the *ovary*. The slender portion above is the *style* and the small knob at the top the *stigma*. Of these three parts, the style is of least importance and it is not found in the flowers of many species, the stigma in such cases growing from the top of the ovary, as in the trillium (fig. 4).

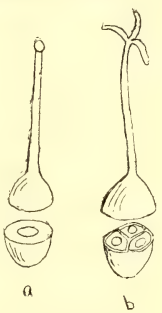

FIG. 5.

The stigma is the part of the flower that receives the pollen grains from the stamens. In the process of fertilization the pollen falling on the stigma germinates there, each grain producing a tiny tube which makes its way downward through the loose tissues of the style to the ovary and there stimulates the embryo seeds into growth. If no pollen falls on the stigma, no seed will be formed in the ovary. The stigma is therefore usually moist and sticky so that the pollen will adhere to it and

is borne in the position most favorable to the reception of the pollen.

Plants have many ways of securing pollenation and the stigmas vary in shape to suit their needs. In flowers that are pollenated by insects the stigmas are seldom very conspicuous, but in wind-pollenated plants, such as grasses and sedges (fig. 6, *b*), they are often long and feathery to enable them to catch any pollen that may happen to be floating by. Frequently, too, the stigma is not terminal, but the stigmatic surface may extend down one side of the pistil. For some interesting examples of stigmas the student may examine the blue flag (*Iris*), the evening primrose (*Oenothera*), the poppy (*Papaver*) the pitcher plant (*Sarracenia*), the spatterdock (*Nuphar*) and the lily. The principal office of the style seems to be to hold the stigma in the proper position for pollenation. In some cases it is very long as in Indian corn where each strand of the "corn-silk" is a single style. Ordinarily the style grows from the top of the ovary, but occasionally it is produced at the side and in the mint family it grows from the base.

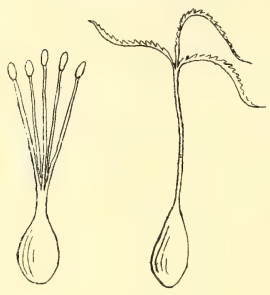

FIG. 6.

In five-parted flowers there should be at least five pistils but it is seldom that a flower contains this number of separate pistils. Examples of this, however, may be seen in the flowers of columbine (*Aquilegia*) and live-for-ever (*Sedum telephium*). There are often less than five, as in the cherry, where the others are supposed to be suppressed; but more frequently what at first sight appears to be a single pistil consists of the original number joined together. There are various ways of ascertaining whether this is so or not. In a compound pistil there is usually a little ridge where each pistil joins the others and along which the seed pod opens later, as in the violet and pansy. Often only the ovaries are consolidated as in the

St. John's-wort (fig. 6, *a*) when the styles and stigmas show the number of pistils. When the styles and stigmas, also, are united, the compound stigma usually has as many lobes as there are pistils. By cutting through a compound ovary one can usually decide how many pistils have been consolidated by counting the number of cells, each cell, of course, representing a single pistil. Thus in the Amaryllis (fig. 5, *b*), a three-parted flower, what appears to be a single pistil is really composed of three. In a few cases, however, the consolidation has gone so far that the partitions in the ovary have disappeared, as in figure 7. The consolidation of the pistils always begins at the base. The ovary may be compound and the styles and stigmas separate, but these latter are never united unless the ovary is, also. Among flowers with compound pistils may be mentioned the campions, lilies, saxifrages, evening primroses, flaxes and oxalises.

FIG. 7.

The pistils, whether simple or united, are likely to be few in number—usually five or less in five parted flowers. In some species, however, the number is greatly increased, as in the strawberry where there are a large number collected in a conical head which forms the berry. Other examples may be found in the buttercup, anemone and clematis. In the tulip tree (*Liriodendron*) and the magnolias, the pistils are arranged in a spiral forming a sort of cone, while in the poppy the numerous pistils are in a circle and united.

## DECIDUOUS TROPICAL TREES.

BY O. W. BARRETT.

IN speaking of the silk-cotton tree in the November AMERICAN BOTANIST, Mrs. E. C. Anthony strikes the keynote of that tree's character. Madame "Ceiba," who is down on the books as *Eriodendron anfractuosum*, is a portly-matron sort of tree and I'm inclined to think that she resents in her dignified way the great amount of gossip that has been going about in the botanical periodicals for the

last six months. She has been severely criticized for the too original taste she displays in the matter of her attire, which is considered quite "unseasonable," and for several other ideas which show that she cares very little for the dictums of the best arbor society. Now, it is usually regarded as improper for any tropical tree to pose *au naturel* or to don pale green in the middle of the dry season; but, as Prof. O. F. Cook has intimated to us, she has good reasons for so doing and is by no means alone in this breach of custom; in fact, Madame Ceiba is the leader of a clique, retinue, or whatever you please, and as such she will probably continue to follow her own ideas as regards times for leafing, wearing flowers, and carrying fruits.

Candidly, I am not championing Mme. Ceiba, for I do think she presents a most uncouth appearance unless fully dressed; but she has certainly done much good among botanists by always insisting that they do not really know why trees were deciduous, anyway. The tropical almond (*Terminalia catappa*) is also self-sufficient in regard to seasonal styles in outer garments and is given to a strong taste for reds (and tannins). Moreover she reserves the right to produce one, two, or no crop of fruits per year.

The staid old calabash (*Crescentia cujete*) occasionally breaks through the custom of being evergreen; and at such times the usual epiphytes, parasites, and large fruits on ungraceful branches present an unpleasant spectacle. The Spanish plum, or "Jobo," (*Spondias lutea*) waves its bare arms in the burning sunshine of the dry season for one to three months. The cabbage-bark (*Andira inermis*) follows the same habit but usually puts out a new foliage long before the rainy season. *Jatropha curcas*, the half-forgotten physic-nut, discards its leaves whenever things go wrong or the sun gets too exorbitant with the water tax. The Ciruelas (*Spondias purpurea* vars.) of course follow their big sister, the "Jobo," in the matter of dress. Even the should-be-famous Goano (*Ochroma lagopus*) is a hanger-on upon the edge of Mme. Ceiba's set. And

there are others. And they would have us to understand that deciduousness among trees is a very complex and interesting problem for botanists to work out.

*Mayaguez, Porto Rico.*

The editor takes the liberty of adding the following notes on the "Foliar Periodicity in Ceylon" from the paper by Herbert Wright read before the British Association for the Advancement of Science last year. It will be seen that Ceylon trees behave much as do those of the American Tropics.

In Ceylon, there is no relationship between deciduous and allied species. The same genus may or may not contain deciduous species, or as in the genera *Terminalia*, *Ficus*, *Sterculia*, *Stereospermum*, and many others, there may be a very large percentage of the species deciduous. Some natural orders, as, for instance, the Sapotaceæ and Ebenaceæ, are peculiar, in that only one or two species are other than evergreen, and not a single natural order can be quoted which has a high percentage of deciduous species. Nevertheless, though this investigation is quite young, I have obtained nearly *200 species* of Ceylon trees which pass through a deciduous phrase at recurring periods of time. It is worthy of note that though different specimens of the same species show every variability in the period of time at which they drop their leaves and produce new foliage, yet the same tree passes through this phrase at exactly corresponding times from year to year.

In studying the behaviour of our deciduous trees the most usual conclusion is that no law and order prevails, and any tree drops its leaves how and when it chooses. There are, however, certain features which point to a climatic response, and others which indicate that the personal or interval forces are the chief agencies at work. It can be definitely stated that the majority of our deciduous species show a response to climate, in so far that they do, in climates similar to that prevailing at Peradeniya, drop all their leaves and remain leafless during our hottest and driest season. This hot dry period extends from January April or May, and the leafless trees of *Bombax mala-*

*baricum*, *Eriodendron aufractuosum*, *Spondias*, *Mangifera*, *Stereospermum chelenoides*, *Ficus Arnottiana*, *Derris robusta*, *Careya arborea*, *Ficus religiosa*, *Cratæva Roxburghii*, and very many other species give a characteristic barren appearance to the arborescent vegetation. The deciduous trees seem, therefore, only to recognise one hot dry period of three to four months as against the alternating dry and wet months of the remainder of the year. Further, every tree of *Termimalia catappa* undergoes a complete change of leaf during the dry part of each monsoon, and other species, I suspect, undergo foliar repletion twice every year. In addition to these we have some species, not native, which though they drop all their leaves and regain complete foliage at one time of the year, also suffer partial falls and productions at other times of the year.

Instances of acclimatisation are well known, but there are also some species which do not appear capable of readily accommodating themselves and drop and reduce leaf during any month of the year. This is characteristic of *Cedrela Toona*, planted in the up-country and a native of Australia. There are some species which though in the Peradeniya districts are quite deciduous, yet in the more equable climate of Java are quite evergreen.

Though the climatic effects are obvious on many of our species, there are several trees which behave in a manner indicative of personal or interval factors being at work. Many species drop their leaves and regain full foliage at a time which appears decidedly disadvantageous. Many retain full possession of their foliage or put forth the whole of the young tender leaves at a time when the physical condition favour maximum transpiration. These species may be less plastic to the climatic forces, or it may be that they can achieve their ends in opposition to still more severe external forces.

If one selects trees of *Lagerstrœmia flos-regina*, *Bridelia retusa*, or species of *Canarium* or *Palaquium*, he will find that though they exist alongside each other under

conditions which are physically identical, yet the time of fall of old leaf, production of new leaf and of flowers differs considerably in specimens of the same species. In the first mentioned species, the variation is a question of months, and to see members on the same plot, dropping their leaves when others are quite bare, others in full old leaf, and others in full new leaf and flower impresses one with the significance of the internal forces.

Again there are species which undergo defoliation at approximately the same time of the year though they are under very dissimilar climates, and one in led to infer that foliar periodicity is inherent and asserts itself no matter what external forces are at work. Many species drop their leaves and remain bare during a period of wet cool weather when the transpiration is probably at a minimum. This occurs at Peradeniya with trees of *Albizzia procera*, and *Pterocarpus echinatus*, during the dull moist months of June and July. The periodicity would here appear to be inherent, though there is the possibility that these plants have, in the migration of species, found themselves at a place where the climate is not in harmony with their original periodicity.

The feature which impresses a resident in Peradeniya is undoubtedly the great irregularity in the foliar periodicity of the different trees. It would be very difficult to draw general conclusions as every tree has its own peculiarities. There is not a month in the year when all the trees are in full foliage, and this can only be explained when we possess a better knowledge of the internal forces at work in every species.

The most important point, however, rests in the fact that many of our markedly deciduous trees at Peradeniya and still more so in the northern districts of Ceylon, remain bare only for a part of the hot dry season, and perhaps when the temperature and dryness of the air is at the maximum they burst out into full tender foliage. The output of leaves at any time necessarily occasions increased transpiration, but when this occurs at our hottest

and driest time the transpiration is probably at the maximum. It is therefore very difficult to correlate the deciduous phase with the theory of checking transpiration in every instance, and in these cases we must look for other forces which are probably internal.

## Note and Comment.

WANTED.—Short notes of interest to the general botanist are always in demand for this department. Our readers are invited to make this the place of publication for their botanical items.

AMERICAN ABSINTHE.—According to the newspapers, this intoxicant is now being made in America. The wormwood (*Ambrosia absinthianum*) from which it is made is said to be cultivated in various parts of Wisconsin.

BLASTED BUDS OF THE MANDRAKE.—It is almost an invariable experience to find dozens of blasted mandrake buds for every perfect flower. The question is, what causes it? Anyone who can tell is requested to communicate the information to this journal.

THE PROLIFIC GROUNDNUT.—Some plants of the groundnut (*Apios tuberosa*) planted in the editor's grounds a few years ago, have laid up such subterranean stores that the earth is literally packed with them. Many of the tubers are as large as medium-sized potatoes.

POPULAR NOVELS AND TREES.—According to *The Scientific American*, the aggregate sales of nine of the recent works of fiction have reached 1,600,000 copies. To make that number of books, required 2,000,000 pounds of paper and to make this amount of paper more than 4,000 trees were used. And these nine novels form but a very small part of the output of American printing presses. Some novels may be worth 4,000 trees, but we all know of others for which we would not exchange a single tree.

TEA-LEAF FERN.—A western correspondent writes that in some sections *Pellæa andromedaefolia* is known by this name. It is more frequently called coffee fern. The pinnules are rather elliptical in outline and about the size of a grain of coffee, whence, probably, the name of coffee fern. Possibly tea-leaf fern is due to an association of ideas.

A DOUBLE CINQUEFOIL.—Dr. A. A. Angell recently sent us an interesting example of a double flower in the common cinquefoil (*Potentilla Canadensis*). A large patch of it was found in North Carolina by Miss Alice Stillman. The ordinary form of this plant is too plentiful to be sought for cultivation, but the little yellow roses of the double form would make a welcome addition to the wild garden.

SYMBIOSIS OF NEW JERSEY TEA.—When a plant is found thriving in dry and sterile soil, one is always warranted in the suspicion that it is helped in its work under ground by the bacteria. The partridge-pea (*Cassia chamæcrista*) of sandy wastes puts up its attractive flowers by such assistance and the New Jersey tea (*Ceanothus Americanus*) which flourishes on sterile hillsides has thousands of bacteria upon its roots. So large and abundant are the nodules formed by the bacteria that it is difficult to dig up a plant without noticing them.

MOSS AS A FEATURE IN THE LANDSCAPE.—Most walkers in the Eastern States are familiar with the moss called *Ceratodon purpureus* though they may not know it by this name. Apparently it has no common name, a fact which shows that although it may be familiar to the sight, it is not often a subject for mention in conversation. It is most abundant in sterile ground early in spring, and is at once recognized by the deep wine-color of the stalks which hold the capsules aloft. It grows often in dense patches and is one of the few mosses that can give a color note to the landscape. Seen after a rain with the sun shining on it at the right angle, it makes spots of perfect flame-color among the dead grasses. The cord moss (*Funaria*

*hygrometrica*) is another moss that is often prominent in the landscape from the yellow-green hue its stems impart to ground recently burned over. In the same places *Bryum argenteum* often gives a silvery tinge to the earth.

Butterfly-weed Difficult to Eradicate.—A correspondent notes that it is exceedingly difficult to root out the butterfly-weed (*Asclepias tuberosa*), any little root left in the soil soon forming a new plant. The same thing is true of the common milkweed (*Asclepias cornuti*) and the characteristic will probably be found to extend to other members of the genus.

Rare Plants.—I suppose every plant collector is pleased when he finds a rare plant. I have just learned that a plant in my collection is so rare that only two persons have reported finding it. The plant is *Silene Spaldingii*, and is not common even here. The flowers are not showy and could be easily passed by. *Polygonum polygaloides*, said to be rather rare, is very common here, and *Ribes setosum*, a brierless gooseberry, is not uncommon.—*Susan Tucker, Cheney, Washington.*

Taste of Indian Turnip.—The books all affirm that the corm of Indian turnip or Jack-in-the-pulpit (*Arisæma triphyllum*) is intensely acrid and most botanizers are content to take their word for it. The fact is, however, that the corm is not acrid at all, as any one who has the courage to experiment may find out for himself by chewing a small portion. The experimenter may be warned that while the word acrid does not properly characterize it, there may be others equally strong that do, and he should try only a very small portion. When a piece of the fresh corm is chewed the mouth feels as if being pricked with countless needles, especially at the base of the tongue. In a very short time this sensation ceases so long as the tongue is held perfectly still, but the least movement renews the prickly sensations that tingle like shocks of electricity. In the course of twenty minutes most of the tingling passes off, but one may feel faint twinges for an hour or more longer.

BIRCH SAP.—Apropos of the interesting note on the sap of *Betula Lenta* in the March number, I would like to add that there is rather more than a "suggestion" of sugar in it; for, when boiled down it requires only a few quarts of the fresh sap to make a generous dish of a highly flavored, reddish, waxy sugar. As a boy on the old Vermont farm I used to delight to drink the clear, cool, aromatic sap of an old black birch which stood among the maples and was tapped in the ordinary manner,—partly for fun and partly for the delicious and healthful (?) beverage it afforded. The sap of *Betula lutea* has a rather flat taste, and that of *B. papyracea* has a slight acridity.—*O. W. Barrett, Mayaguez, Porto Rico.*

SHOWERS OF SULPHUR.—From various points in the south have recently come reports of sulphur showers which in the popular opinion were occasioned by volcanic disturbances in some out-of-the-way part of the world. Investigation soon showed, however, that the "sulphur" originated much nearer home, being, in fact, nothing else than the pollen from the pines. The pines, as most plant students know, bear their pistillate flowers in the cones, with which we are familiar, but the staminate flowers are in little catkins on other parts of the tree. The trees are wind pollenated and to insure that some pollen will reach the pistils this is borne in great quantity and at the time of blooming sowed on every passing breeze, hence the showers.

ARAB TEA.—If Arabia is mentally associated with any drink, it is likely to be with coffee, but it appears that the Arabs have a tea that is much more characteristic of the country. This tea is made from the leaves of a plant called qat (*Catha edulis*) and according to *Indian Planting and Gardening* is much used in Arabia and Abyssinia. Unlike tea, coffee and kola the plant does not contain caffeine. Its stimulating qualities are due to an alkaloid named cathine. Recent investigations have shown this to be a valuable drug-plant. It has a powerful stimulating action on the nervous system, banishes sleep, restores the physical forces and sustains muscular activity. The

statements of the early botanical writers, were quite at variances with regard to the structure of the plant. Some reported that it had red twigs and alternate leaves while others insisted that it had opposite leaves and green twigs. Curiously enough the plant has both kinds. The first branches borne are erect with red bark and alternate leaves. These give rise to horizontal branches with green bark and opposite leaves. On these latter the flowers are produced.

CASTILLOA FRUITS.—A note in the March BOTANIST concerning the alluringness of the Para rubber tree fruits reminds me of the big catches of butterflies I have made under the fruiting *Castilloas* of South Mexico. The fruit, which may be likened to a huge raspberry spread out flat, contains a good quanity of a strong-smelling red pulp; and to this decaying fallen fruit come all the insect epicures of the neighborhood,—great, lazy, purple-winged *Caligos*, nervous, scarlet-and-blue *Callicores*, and gaudy, dashing *Epicalias*—invited guests of "el hule" (*Castilloa elastica*). —*O. W. Barrett, Mayaguez, Porto Rico.*

THE SUNDEW IN A NEW HABITAT.—Last March in one of the wild tangles of Spring Hill, near Mobile, Alabama, along a dry, sandy roadside, I found many plants of the round-leaved sundew (*Drosera*) all growing rank and thrifty. I never before saw so much of the viscid secretion characteristic of this plant as was running or hanging from their leaves. In places the streams or ropes had broken and the stuff lay in globule-like masses on the ground covered with sand grains and other bits of loose dirt not readily absorbed. These plants all grew in the open, freely exposed to the sun, and were not in the least protected by shade of tree, bushes or other low growth. My plants, too, were all on the upper side of the road where it was cut along the side of a knoll so that all the moisture drained away as soon as it reached them and there was no water near. When I reached Washington I went to the big library and after following every clue to the limit I found no authority for *Drosera rotundifolia* to

grow on that dry, sunny, sandy roadside. When Mrs. Bradshaw, in AMERICAN BOTANIST for October, called turkey mullein clever in its way, it reminded me of my sundew and I wondered if it was not trying to moisten its roots with its own vital fluid. Again in the February number Mrs. Bradshaw indicates that she is thinking along this same line for she refers to filaree as canny, cunning and having perception. When it is established some day, that plants in their way *know* a thing or two botanists will not be at all startled; but will quietly say: "Ah! We told you so, we told you so."—*W. W. Munson, Otisco, N. Y.* [If there are any plants that *know*, it is as likely to be these animal-eating sundews as any, but the great amount of secretion mentioned in this case is probably more easily explained by the fact that sunny situations usually have the effect of increasing the secretions of the plants.—ED.]

THE LARGEST SEED.—The reader who, in "Note and Comment" in the October AMERICAN BOTANIST, asked whether the cocoanut is the largest seed, may be interested to know that it is not. Cocoanuts seldom weigh over 12 pounds when fresh picked. But there is a rare palm known as *Lodoicea seychellarum* which grows on the rocky islands of the Seychelle group northeast of Madagascar that produces a fruit which is said to weigh sometimes as much as 40 or even 50 pounds. Judging from dry museum specimens of the seed, these figures may be somewhat "travelerish" still, there is not much doubt as to where the "largest seed" honor rests. Three years are required for the germination of this huge seed and it is said that ten years elapse between flower and complete maturity of fruit. The palm, which attains a height of 100 feet, is naturally exceedingly rare under glass; a specimen has recently flowered, however, at the Pittsburg Botanical Gardens. By the way, will the reader who champions the portly pumpkin tell us whether 250 pounds is the "record" weight of that fruit?—*O. W. Barrett, Mayaguez, Porto Rico.* [Possibly the largest pumpkin would weigh 250 pounds but this is near the limit.—ED.]

# Editorial.

Some time ago we promised some keys to the flowers based upon their colors. It should not be concluded that they have been forgotten since they have not yet appeared. It has been thought best to have them appear at the end of the series of articles for the beginner now being published, as being likely to be of most use in that connection.

* * *

Members of the American Botanical Club should remember that there is but a short time left in which to submit reports in competition for the prizes offered to the Club. In addition to the honor of having written the best report, the choice of any manual of botany is a reward well worth working for. The second prize is a copy of Bailey's "Botanizing," and there are three other prizes of subscriptions to the BOTANIST. Reports must be received by June 15, 1903. Any member may compete and the reports may be upon any botanical subject. Every member should send at least one report to the President, and two are better than one.

* * *

In writing of certain species of grass in the *Botanical Gazette* for March, A. S. Hitchcock, of the United States Department of Agriculture, says of one of them, "The Rochester Code would require that the specific name *cynosuroides* be applied to the Linnæan plant, but I will leave the transfer for those who are thus inclined." This shows a commendable spirit of forebearance and one all too rare among botanists. Having discovered that this name could be transferred, most botanists would have jumped at the chance to do it. It is pleasing to see an officer of the government refuse to change well known names merely for the sake of "priority." May his kind increase.

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It seems that in our recent note in this journal concerning the longevity of botanists we cited comparatively

youthful examples. John Goldie who explored parts of Canada early in the last century lived to be 94, but even this is not the limit, for a subscriber writes to say that her great-grandmother, a botanist of note in her day, died at the age of 104. This is certainly a clincher for our argument that botanists live longer than other people.

## BOOKS AND WRITERS.

My Kalendar of Country Delights, by Helen Milman, has just been issued by John Lane, New York.

Henry Holt & Co. will soon bring out a new fern book by Dr. C. E. Waters which will be entitled "Ferns." It will contain numerous illustrations from photographs and considerable matter of a popular nature.

The first number of *The Atlantic Slope Naturalist*, a bi-monthly edited by Dr. W. E. Rotzell, Narberth, Pa., has made its appearance. The initial number is a good one and Dr. Rotzell has our best wishes for success.

Maud Going whose "With the Wildflowers" and "Field Forest and Wayside Flowers" are well known, has just issued a companion volume entitled "With the Trees." This is fortunately not another manual for naming the trees, but belongs in that small and growing list of books about trees. It is for the reader who knows the trees and would add to his knowledge about them. The scope of the book is indicated by chapters devoted to such subjects as "When the sap stirs," "Late blooming trees," "The mellowing year," "In a hillside pasture," "In the high woods," etc. The book has forty illustrations. It is written in clear and attractive style and is crowded with information about trees. It will form very pleasant summer-time reading. (Baker & Taylor, N. Y., $1.00 net.)

It is probable that gardening in all its phases has received more attention in Great Britain than in America. Possibly when the gardener aims at mere dollars and cents, we Americans have the best of it; but in other things we must still import our knowledge as we do many of our

gardeners. For this reason the series of "Handbooks of Practical Gardening" under the editorship of Harry Roberts will prove interesting to Americans. There are now nearly twenty of these handbooks, each devoted to some special topic and written by an acknowledged British authority. Among some of the latest received are "The book of Pears and Plums" by Rev. E. Bartrum, in which the pears and plums are very thoroughly treated from all standpoints—cooking, storing, packing, marketing and preserving as well as the usual ways of cultivating. Chapters are also devoted to cherries and mulberries. "The Book of Climbing Plants" by S. Arnott goes into the subject more exhaustively than its title would indicate. Besides chapters on annuals, deciduous and herbaceous climbers, evergreen climbers and climbers under glass, there are chapters on hardy wall shrubs in which fifty or more shrubs suitable for training against walls are discussed. This method of cultivating shrubs is seldom followed in America and but little is known about it here. "The Book of the Wild Garden" by S. W. Fitzherbert is one that can be recommended to all American cultivators of flowers for by the term "wild-garden" the British do not mean a garden of what are commonly called wild-flowers, nor yet a cultivated garden run wild, but instead a plantation of perennials that after being established are left to themselves. The information is arranged under such heads as bulbs, dwarf growing trees, flowering shrubs and trees, water plants, bog plants, etc. In each section the species are arranged alphabetically with data as to soil, shade and general cultivation as well as notes on the color of the flowers, common names, etc. Many American species appear in the lists such as the trilliums, cowslips, magnolias and catalpas. (John Lane, N. Y., each $1.00 net.)

# THE AMERICAN BOTANIST.

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## POPPIES.

BY M. F. BRADSHAW.

THERE may be somewhere—somewhere—a land where the poppies are fairer than in California.

I do not know, I only know that here they are so fair, so varied, so regal, that sometimes they are so stately and grand, sometimes gay and flaunting in gorgeous raiment, sometimes cunningly meek and demure, that you love each one the best and you know that Paradise will be no place for you if your poppies are not there.

Which one shall I bring first for you to see and admire? I know not which ranks first and so will begin with the dear, delicious little "cream cups," exquisitely dainty, and spite of such a crushing name as *Platystemon Californica* the earliest to greet us in the spring.

They are so very modest and so quiet in their color and size and numbers, that you are scarcely remembering about them when you start on your wild flower tramp. But just the same you see their blessed, little woolly heads and down you drop upon your knees, telling all who may be there to hear, "Oh! here are the cream cups!"

Each budded head hangs bashfully and is covered with the most infantile, silvery down as is its stem. When it gains confidence to raise its head and look into your face—was ever anything so pure and innocent? Petals cream white with clear yellow at their base, anthers and stigmas pure white, stems of a dull, pale purple, and covered as are the sepals with silvery hairs and the leaves pale green, broadly linear and clasping.

On your next trip you are aware of the *Eschscholtzia*—the far-famed "California poppy." Aware of it to the

exclusion of all else for it blazes in sheets of flame from the hillsides; and the plains though embroidered in many colors, wear the boldest splashes of yellow. No fear of exterminating this brilliant native, no need of a protective society; gather what you please. Acres and miles of flowers as far as the eye can reach, even to the dim horizon: our flowers are not scattered on the plain but laid on in glorious masses of color, an acre or less of white, of yellow, purple, blue.

When you have had time to take it in, and to realize it a little, you may note that there are two species of *Eschscholtzia* growing together, one orange, the other yellow. In the mountains there are also two others, but with small difference: the famed California poppy is the flower of the plains and lower hills.

Then, rarely seen, is a red poppy of a somewhat smaller size and more fragile form, gorgeous as the red poppy of our gardens. It is the "wind poppy" and sways as airily as if it never felt the weight of its name, *Meconopsis heterophylla*.

Another genus is *Dendromicon rigidum* the tree poppy. Its flowers are the size of *Eschscholtzia*, a pale yellow, and it gets its name from the thick rigid leaves. It is, however, a bush instead of a tree and likes to live on the bank of a stream in the upper reaches of the canon.

About the same time, which is May or June the *Argemone* blooms. It is a large white flower like a garden poppy only the petals are thinner and somewhat wrinkled and the leaves are veritable thistle leaves, giving the one species the name of *hispida*. It grows two or three feet high.

Another genus is called *Platystigma* with four or more species, but I am not going to describe that, simply because I never saw any of them.

Last, not least, comes *Romneya Californica*. We call it the Matilija poppy and if you pronounce it correctly—Mah-til-la-ha—you will agree that in name, at least, it is graceful. I wish I could give you one real glimpse of this

queenly flower. Growing always in groups and attaining a height of ten or twelve feet, bearing masses of pure, white flowers, no plant need ever hope to enjoy more enthusiastic admiration than you must give to this one.

It comes in June, when the sun has grown hot and the rains so long past that most flowers have given up trying to look fresh and vigorous. Not so my poppy tall, stately and serene.

From five to seven inches in diameter, these flowers, petals thin and fluted, globe of anthers an inch through, of deepest, clearest yellow borne on black filaments, the black more felt than seen—each branch bearing a great terminal cluster—flowers glorious beyond your dreams.

You carry home an armful and your way is marked by a stream of sweetest incense swung from these chalices of white and gold.

*Orange, California.*

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## THE CLIMBING FERN.

BY BESSIE W. STILLMAN.

ONE of the most interesting sights, to the plant lover, in the beautiful city of Washington, is Center Market on a "Market Day." Then the country people, mostly negroes, come in to dispose of the wares, which they display upon stands on the side-walk surrounding the market.

Upon these stands I found a strangely miscellaneous collection—wild flowers in profusion, "garden sass," "yarbs," "baccy" in rolls strongly resembling great pretzels, butter, eggs, fowls, etc. Beside the stands were crates containing grunting pigs and bleating calves, while wagons filled with produce were backed up to the walks.

A friend wanted some arbutus. While she was examining the various bunches exposed for sale, I wandered around for a general survey. From a stand covered with dainty bluets, partridge berries and moss, hung a delicate vine which, with a thrill that set my blood a tingling, I at once recognized as the climbing fern, *Lygodium palma-*

*tum*, known to me heretofore only through pictures. I must have given audible expression to my glee for a number of people crowded up to see what my prize might be and then turned carelessly away wondering how I could become so excited over a bunch of green leaves.

I purchased the fronds and then attempted to find out where I might see the fern growing, but all to no purpose. The pretty young negress in charge evidently feared I would uproot all her plants and thus she would be compelled to engage in other business. And why should she not? Are not the majority of people Vandals when it comes to their treatment of the wild plants? It was a disappointment but I had a fellow feeling for the girl. Do I not carefully conceal from all but a very few trusted friends the haunts of rare plants? Our motives in protecting the plants differ a little, I suspect, but we had a common fear of the enemy.

Forced to be content with the detatched fronds I hastened to press some under my trunk and send some to a fern-loving friend.

Can any resident of Washington or vicinity tell me whether *Lygodium palmatum* grows near the city? My friend, the Cautious One, said she came from twenty miles out, in "Merrylund," which, considering the freshness of the fronds, the delicate nature of the plant and the evident lack of care which had been taken to preserve them, to say the least, made me have my doubts.

*Tenafly, New Jersey.*

## ODD ODORS.

BY O. W. BARRETT.

The flowers of the anacahuita (*Sterculia carthaginensis*) have the rank smell of a menagerie tent or elephant house; they are believed to be a sure cure for colds. The calabash tree (*Crescentia cujete*) proclaims its propinquity by a mephitic odor which is not only disgusting but quite sickening; it has been stated that this is due to the decaying flowers which are nearly always present, but the fresh

ones are about as bad. That forgotten fruit, the genipap, or "jagua" (*Genipa Americana*) has an odor which is at first exceedingly repulsive to most persons, but after a few "whiffs" it becomes quite agreeable; this fetidness accounts for the unpopularity of such a fine large fruit. The foul smell of the dry pulp of the algarob (*Hymenaea courbaril*) also precludes its extensive use as a food. One of our most beautiful cabinet woods, here, cannot be utilized on account of its very disgusting effluvium. In the virgin forest of the interior are found two shrubs whose leaves apparently ought to be safe from insect attacks: when crushed in the hand the leaves of one emit the sickening scent of carbon bisulphide, while those of the other are redolent with a strong smell of chlorine gas.

When the native Indian of the interior cannot see the leaves of a forest tree or is in doubt as to its identity, he chips off a bit of the bark with his machete and settles the question with a sniff or two. As he says, no two trees smell alike; but I do not understand how he can carry in his memory the odors of a hundred or more distinct varieties. By the way, several botanists have expressed their opinion that the Porto Rican native has a broader and deeper knowledge of his local flora than is common with natives of other West Indian islands,—which is saying a great deal.

*Mayaguez, Porto Rico.*

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## HINTS FOR BEGINNERS IN THE STUDY OF MUSHROOMS.

BY MRS. G. M. DALLAS.

IT is a great pleasure to any lover of nature to wander through the woods or down some shady lane on a bright summer's day, and still more so, if he is fond of the wild flowers and ferns, and loves the study of mushrooms. This term here used, includes all kind of fungi, the gill bearing ones called *Agarics*, with their bright coloring; the bracket fungi that abound on trees, stumps and fences,

and the little cup fungi, so brilliantly red, half hidden by the moss on which they grow. If one takes up the study seriously and desired to add new specimens to his collection, he must make good use of his eyes, explore carefully every crevice in the banks that line the road, every fallen tree and stump, and search the thickest part of the woods.

And having found them, it is most important to note every fact concerning them. First, as to where they grow; in woods or open pastures or on marshy ground. Second, do they grow on the ground or on wood or on other fungi. Third, the character of the soil; is it clay or sandy or leafy mould? Fourth, what is their mode of growth; are they solitary or in clusters (cæspitose) or do they wander in twos and threes together? The date of their discovery should be noted, at what time they were seen and how they continue to live. It is important to gather as many specimens of each species as possible for examination, and they should be dug up carefully with a trowel or knife, so as not to break the volva, if there is any, or the root that we sometimes find.

The mushrooms that have gills are called *Agarics*. They have been classified by the color of their spores. If one finds a mushroom with pores instead of gills, under the cap, somewhat resembling a sponge in appearance, it is probably a *Boletus*; then comes another group that also has pores, but the pores are hard or corky and do not separate easily from the cap. This belongs to the family of *Polyporaceæ*. Again, there is another group where there are spines or teeth instead of gills, on which the spores are borne and these are called *Hydnums*. There is one more group the members of which we constantly see in the woods, the club shaped or coral fungi called *Clavaria*. They are generally white, yellow or pink, and look like a mass of branches arising from a thick base. These five groups belong to the Hymenomycetes or membrane fungi. There are, besides these two, other groups: one called Garteromycetes or stomach fungi, which contains the

little birds'-nest fungi which we find on twigs and branches, with their tiny eggs inside, also the puff-balls and the Geasters or earth-stars familiar to nearly every one, and the Phalloids or stink-horn fungi, which are often beautiful to look at on account of their coloring and the stems covered with lace work, yet are disgusting by reason of their terribly offensive odor.

The last group is the Ascomycetes or sporesac fungi. This contains the morels with their honeycombed caps that are considered great delicacies for the table; then the Hevellas or yellowish mushrooms, easily known by the shape of the caps which are lobed and irregularly waved, and lastly the Pezizas or cup fungi, which vary from the minutest species of only a line in width to the fleshy ones of 3 to 4 inches in diameter. These sometimes resemble delicate shaped goblets with slender stems or again they look like cups made of india rubber cloth, and some are of brilliant colors, both red and orange.

These numerous families of which the mere names are so bewildering to a beginner in the study, but which revive such pleasant recollections in the mind of one familiar with them, may be met with constantly in one's walks, and specimens of all these groups may be found in our baskets after a collecting tour of one summer morning. There will be sufficient to furnish employment for many hours in examination of our treasures. The next step after returning from our stroll will be to arrange them in classes and genera and find out their names and character.

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Value of Essential Oils to Plants.—At a recent meeting of the Linnean Society, the question of the use of essential oils in the economy of plant life was brought up. These essential oils are usually regarded as mere waste products, but it has been conjectured that they may possibly aid in protecting plants from night frosts. It is well known that moisture in the air prevents radiation and consequent loss of heat and it has been found that the addition of essential oils increase the absorbing power of the air for heat rays.

# BOTANY FOR BEGINNERS—III.

## THE STAMENS.

The stamens will always be found in a circle in the centre of the flower. They will be recognized at once as thread-like bodies, each with a little knob at top (fig. 8, *a*). The stem or threadlike portion is called the *filament* and the knob, the *anther*. The principal use of the filament seems to be that of holding the anther in such a position that its pollen will be scattered to advantage. In the pistil the style performs a similar service for the stigma by holding it in a proper position for pollenation and just as in some cases the style may be missing, so too, the filament may be without loss to the effectiveness of the blossom. In that common but interesting plant, the water-carpet (*Chrysosplenium Americanum*) the filaments are so very short that the anthers appear to be without stalks.

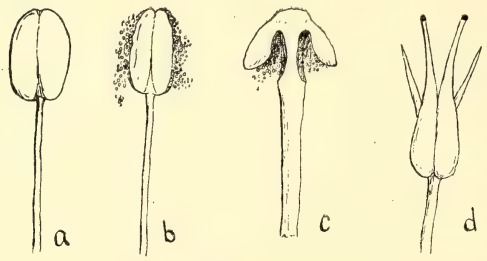


FIG. 8. Forms of stamens.

The anthers are two-celled bodies in which the *pollen* is produced. At maturity the anther cells open allowing this pollen to escape (fig. 8, *b*). Although the pistils are the parts of the flower that bear the seeds, they are useless without the stamens, for no matter how advantageously they may otherwise be situated, they cannot produce seed unless some of this magic pollen falls upon their stigmas. The anthers usually open by a slit lengthwise of the anther-cell much as a pea pod opens, but certain species have modified even this process. In the heath family, the wintergreen, azalia, shin-leaf, blueberry and other familiar species have anthers which open by a round pore at the tip (fig. 8, *d*) and in the barberry, witch-hazel and sassafras they open by tiny lids (fig. 8, *c*). The anthers are

usually borne at the top of the filament but in other cases they are borne on the back of the filament in such a way that one anther cell seems to be on each side of the filament. Occasionally, too, the top of the filament branches, each branch being tipped with half an anther—that is, one anther cell. Examples of this may be found in the catalpa and in a majority of the plants in the mint family. In the lily and certain other plants the anthers are balanced on the very tip of the filament and seem able to swing in any direction.

The number of stamens is seldom less than five in five-parted flowers or three in three-parted ones. In the mint family with five-parted flowers there are usually four stamens, in the four-parted flowers of the cress family there are six stamens and in the three-parted flowers of orchids there is often only one, but the majority of flowers have as many or more stamens as there are petals, sepals or pistils. When there are only as many, they are in a single circle or *whorl*; when more they may be in two or more whorls. The advantage of numerous stamens is shown in the columbine where there are four or more whorls which ripen in succession beginning with the outer whorl. This enables each flower to supply fresh pollen a much longer time than it could with a single whorl of stamens.

The stamens are often assembled in groups as in some of the St. John's-worts where they occur in three or more tufts, or they may be formed into tubes and rings. In the sunflower and others of its tribe, the stamens are joined by their anthers; in the lobelia, anthers and filaments are joined into a tube; in the pea family nine of the ten stamens are joined (fig. 9, *b*) and in the mallow the stamens are formed into a sort of hollow column surrounding the pistils (fig. 9, *a*).

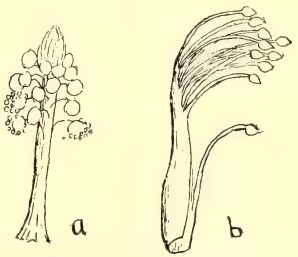

FIG. 9. Forms of united stamens

## THE RECEPTACLE.

In our conception of the flower as a modified branch, we take the view that sepals, petals, stamens and pistils

each represent different whorls of leaves, but which are not separated by sections of the stem as leaves are. The pistils, therefore, are supposed to occupy the very end of the stem; but as the other organs of the flower are borne so close to it, this tip of the stem often takes on peculiar shapes to accomodate them and is then called the *receptacle*. One may see a good example of the receptacle in the cone-shaped object on which the red raspberry is borne. In the strawberry the receptacle is lengthened to give room for the numerous pistils, but unlike the raspberry it does not separate from the fruit at maturity. The top-shaped affair in which the seeds of the American lotus (*Nelumbium*) is immersed is regarded as a receptacle, and the centre of the magnolia's cone of fruit is also of this nature while that of the tulip tree's fruit is very noticeable in winter after the seeds have separated from it. The receptacle, however, is not always lengthened. Sometimes its purpose is served by its becoming cup-shaped or inverted as in the rose where the pistils are sunk in such a cup and the other organs of the flower perched on its rim. Occasionally the rim becomes thickened, forming what is known as a *disk* such as the eight-angled organ in the maple flower (fig. 10). Nectar is very frequently secreted about these disks, and in some instances it would appear that the production of nectar is their chief function. Nectar, however, is produced by many parts of the flower besides the disk and when fragrance is associated with it, it is probably exhaled by the parts that produce the nectar.

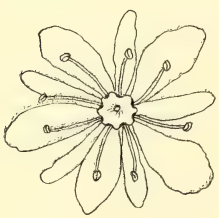

FIG. 10. Flower of maple enlarged showing disk.

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TIRING A LEAF.—A large cecropia moth which came out of its cocoon in the editor's study a few days ago, was given a perch on a geranium leaf in the window. For some time the leaf held its bulky burden erect, but gradually the petiole began to droop until it pointed downward. When the moth flew away the leaf slowly regained its normal position.

# NEW JERSEY TEA.

BY ALBERTA FIELD.

MAKING my way down a steep woodland hillside the other day, I came across a quaint little plant that, knowing its history, reminded me of the tales of those Revolutionary times when articles that are now considered every day necessities were luxuries, which it were easier to abstain from than obtain, and when many were the makeshifts resorted to, particularly at the period when Boston Bay was one huge drawing of tea—undrinkable. Of great importance in the economics of the households of our forefathers, was this little plant which brings remembrance, like Ophelia's rue, for, during the days of the troubles with the fatherland, the young leaves, dried, were steeped and used as a substitute for tea—doubtless drunk with patriotic relish by the Colonial dames, as through its aid they could laugh to scorn the tea levy of the good King George.

However, this shrubby little plant has retained its title of New Jersey Tea ever since, and holds high its white, feathery head in the sunlight in all pride and consciousness of its temporary occupancy of the throne of the great feminine beverage of fragrant Japan, and it still seems to wave its branches patriotically in remembrance. I am not sure that it would not be a more emblematic national flower than many of those suggested, for in the days of the budding Republic, it gave pleasure and relief alike to "ye mistress in ye parlour, and ye maide in ye kitchen," as well as to the Colonial army who drank the home grown substitute for the cup that cheers but not inebriates, with great relish.

After the fall of the fluffy clusters of white flowers, comes some quaint little three-cornered seed berries which, like the leaves, have a faint fragrance not unlike the real tea leaf. The root is bright red in color, and from it is made a cinnamon dye, and the plant was known as "red root" before it aspired to its more pretentious title. John

Burroughs says that it is one of the most adaptive plants that we have, and will grow many feet in height under promising conditions, or will mature seed a few inches above the ground, as a last resort.

*Ashtabula, Ohio.*

## CHILDREN'S NAMES FOR FLOWERS.

BY MRS. A. E. GOETTING.

CHILDREN do not take kindly to Latin names and if we hope to retain their natural love for flowers we must help them to names as full of childish association as possible. In fifty years of close companionship with both children and flowers, I've been puzzled to see so little originality on their part in giving names; they take any common name given by others. Hoping others have had better experience, I report my meager list.

In western North Carolina a very original little girl of six took me in early spring to see her "*little pigs*." She went down among the brown leaves and scratched off the leaf-mold to disclose the swollen though unopened buds of the spotted wild ginger (*Asarum Virginicum*). All her little mates had learned of her to talk readily of *little pigs*.

Two little brothers in northern Indiana took me one May day to see their bed of *pepper-and-salt*. From a little astray a full rod square of dainty blue and white Innocense (*Collinsia*) had taken hold of this favored spot in the woods. The children said their father feared in might become a troublesome weed if spared but those I transplanted to my wild bed, dropped no seeds for the next year.

Along the sandy ridges in Wisconsin in the sixties the children used to wander in search of *images* (*Polygala polygama*). Their eyes saw the little winged forms that only a lens revealed to me.

In the turpentine belt of southern Georgia, three children brought to me some antique vaselike seed-pods saying,

"We call them rabbit-bells." When the spring blossoms led me to *Crotalaria ovalis*, I wrote above the common name of rattle-pod, "rabbit-bells"

*Cincinnati, Ohio.*

## Note and Comment.

WANTED.—Short notes of interest to the general botanist are always in demand for this department. Our readers are invited to make this the place of publication for their botanical items.

A MEASURE FOR GARDENERS.—My sister who is very fond of gardening has the handles of her rakes and hoes marked off in feet. It is great convenience to have a measure at hand in laying off beds or setting plants.—*Mrs. C. A. Iddings, Brinklow, Md.*

FRENCH FLOWER CULTURE.—It is stated that ninty per cent. of the perfume used in the world comes from the strip of mountainous country which lies along the Mediterranean east of Marseilles. The annual harvest of flowers is about 6,000,000 pounds of roses, 5,000,000 pounds of orange blossoms, 3,000,000 pounds of carnations, 1,000,000 pounds of violets, 9,000 pounds of lilies, 6,000,000 pounds of tuberoses and other flowers in proportion. These flowers are mostly raised by peasants who own small farms and do their own work.—*Gardening World.*

ODD ODORS.—Mr. Barrett's interesting notes upon this subject, are reminders that the tropics do not have a monopoly of the unsavory odors. The best-known plant in this line in more northern latitudes is certainly the skunk's-cabbage but the carrion-flower (*Smilax herbacea*) is a good second and we have several others like the bugbane (*Cimicifuga*) and bane berry (*Actæa*) whose flowers have most disagreeable odors at close quarters. The editor seriously doubts, however, if temperate regions or even the tropics holds anything with a viler odor than that of a ripe jack fruit (*Artocarpus*). The fruit is pleasing enough to the palate but difficult to get past one's nose.

PLANTS WANTED.—Mr. Charles H. Coe, Langdon, D. C., desires living plants of our native lady's slippers (*Cypripedium*) except *acaule* and offers in exchange the latter or other plants of his vicinity.

FOSSIL FLOWERS.—The plant remains, with which the students of fossil botany have to deal, consist almost entirely of leaves and the woody parts. In the case of the cycads, however, some specimens have been found so well preserved, that the flowers can be studied almost as well as in the living plants. Even the pollen grains may be observed.

SEED DISPERSAL IN THE CROCUS.—The crocus that puts up its flowers in early March is careful to have its seed producing parts at, or beneath, the surface of the earth. What many people consider the stalk to the flower is in reality only the elongated corolla tube. The seeds ripen close to the earth, but if the capsules opened in such a position they would not fall at any distance from the parent plant. Just as the seeds are ripe, therefore, the stalk that bears them, having remained dormant for quite three months, suddenly elongates, carrying the capsules to a height of several inches above the earth where the wind gradually shakes out the round seeds.

PROTECTIVE PLANT SECRETIONS.—Some experiments that have recently been made in England seem to indicate that plants are protected from certain enemies by the substances in their tissues as well as by external secretions. Tannin has been found to be unpalatable to slugs and snails. These creatures are very fond of carrots, but when the latter are treated with a one per cent. solution of tannin, they will not touch them. The leaves of water plants containing tannin were found to be distasteful to water snails but if the tannin was extracted the leaves would be eaten. Acid sap, bitter secretions and essential oils have similar effects. It should be noted, however, that while snails and slugs may avoid plants possessing these properties, there seem to be plenty of insects that are not so easily defeated.

MAY-APPLE JELLY.—Last summer our May-apples were so large that I experimented with them. I wish I could send you a glass of the fine jelly I made. It is fine, a clear light amber color, and the flavor delicate and delicious. I took some of it to our Horticultural meeting and it was liked very much. It has no medicinal qualities and is one more fruit for scarce years.—*Mrs. C. A. Iddings, Brinklow, Md.* [From the resemblance of the May-apple (*Podophyllum*) to the well known guava (*Psidium*) of the tropics, the editor has often suggested that like the guava, it might be used for jellies and marmalades. It is pleasant to hear of success in this line.—ED.]

PLANT SECRETIONS.—In the April AMERICAN BOTANIST the editor voices a theory that is certainly worthy of discussion. Now that we have outgrown the belief that pretty posies were not made to please mankind, it is time to begin finding out why plants produce certain substances. Students of physiological botany will have work to keep them out of mischief (synonomy) for a century or two at least in telling us just why and how the primary, secondary and tertiary products are evolved and utilized or eliminated in the plant economy. Scorpions and rattlesnakes sometimes commit suicide, but we hope to never learn that the poppy is addicted to the morphine habit.—*O. W. Barrett, Mayaguez, Porto Rico.*

GRASS-NUT.—Referring to the recent notes concerning the use of the word nut-grass, Mr. Julian Reverchon, Dallas, Texas, sends us the following:—The name of grass-nut is applied here to a plant quite different from cyperus. It is the *Nemastylis acuta*, a plant of the iris family with bulbs the size of a pigeon's egg. These have a sweet taste and are really palatable; so much so that the hogs root them out and are sure to destroy the plant where they have access to it. It has been sparingly introduced in cultivation as *blue tigridia* and deserves to be better known not only on account of its beautiful sky-blue flowers but as a vegetable as well. It grows in rich black prairie land and is an early bloomer.

DAHLIA ROOTS EDIBLE?—According to the *Scientific American* the dahlia was originally grown in Europe for its roots which were used as food. Roasted they are said to be both toothsome and wholesome. Further observations along this line would be desirable.

THE WAYS OF PLANT-LOVER AND BOTANIST.—I suppose we were a company of lunatics, according to some standards, to go into ecstacies over a mere handful of plants; but that is one of the privileges of the plant-lover, who may not be denied the expression of his pleasure in finding these embroideries on nature's robe. The cold-blooded botanist with book and vasculum often calmly finds and as calmly appropriates for his cemetery of plant-life, his herbarium, everything that makes the woods and the meadows beautiful. The real plant-lover, who is not disposed to pry too deeply into the intimate secrets of the flowers he finds, enjoys them in their haunts and leaves them there for others to enjoy; unless indeed he brings them away by the camera's aid, for the pleasure of many others.—*Country Life in America.*

EDIBLE ARUMS.—*The Gardening World*, referring to a recent note in this journal regarding the edible qualities of the elephant's ear (*Caladium esculentum*) a member of the arum family, notes that an English species *Arum Italicum* known as Portland sago has been used as food. Both these species are regarded as more or less poisonous in the raw state, but cooking drives out the noxious qualities. The arum family contains numerous plants of importance to man, some being used for food or medicine and others valued for their striking flowers. The skunk's cabbage, jack-in-the-pulpit and green dragon belong to this family and so does the sweet flag or calamus-root (*Acorus calamus*). It is reported that the American Indian formerly made great use of the seeds of the golden club (*Oronticum aquaticum*) boiling and eating them as we do peas. Certain lakes in the Eastern States are thickly bordered with these plants which it is believed were originally planted there by the Aborigines.

THE MOSQUITO PLANT.—Several species of basil (*Ocimum*) have lately come to the front as efficacious in driving away the mosquito. In warmer countries the leaves of the basil have long been used as a febrifuge, and it is of interest to find that the plant not only conquers the fever, but also drives away the pest that spreads it. The species in greatest repute are *Ocimum gratissimum*, *O. sanctum*, *O. pilosum* and *O. villosum*. Many other plants containing essential oils are useful against the mosquito. A writer in *Indian Planting and Gardening* states that he never knew of a native who used cinnamon or cloves to be ill with malaria or cholera and that in his own case a little tincture of myrrh sprinkled about his bed at night always kept mosquitoes away. A list of other oils useful for this purpose was published in Volume II of THE AMERICAN BOTANIST.

THE NAMES OF DRUG PLANTS.—The scientific wights who tinker with our plant names are fond of telling us that their work is necessary in order that we may have a nomenclature that is understood by all, but the practice of the druggists offers a remarkable contradiction. These gentlemen are constantly measuring and issuing drugs, upon the use of which human life often depends, and yet they and the doctors who issue the prescriptions, do not find it necessary to give names, synonyms and double author-citations to indicate the plant indicated. In fact a single word is often enough. Senega does duty for *Polygala Senega*, Lappa for the burdock (*Arctium lappa*), Gentiana for the gentian (*G. lutea*), Calamus for the sweet flag, Sanguinaria for the bloodroot, Geranium for the crane'sbill and so on. It is difficult to see, in the case of the dandelion, for instance, how we have gained by discarding the time honored *Taraxicum officinale* for the nomenclaturist's *Taraxicum Taraxicum* (*L.*) *Karst.* Many similar absurdities will suggest themselves to the thoughtful student.

# Editorial.

Most people are inclined to take offense if the publisher, unless told to do so, stops their magazine at the expiration of the time paid for. It often happens that those who wish to continue are too busy at the moment to attend to renewals and to stop their copy is to make a break in their files which inconveniences them, later, when their renewal is sent in. For this reason we have adopted the policy of sending THE AMERICAN BOTANIST until notified to discontinue. Those whose subscriptions have expired will find a bill in this issue and if they do not wish to continue we should be notified at once. Acknowledgement of the receipt of all such notices will be made. It is hoped, however, in view of the very liberal terms of subscription, and the improvements constantly being made in the magazine, that orders to discontinue will be, as in the past, exceedingly few and far between.

* * *

It is with much pleasure that we make the announcement that this journal is to be enlarged again. For the present, every alternate number will contain four extra pages and it is expected that at the end of the new volume every number will be thus increased. This is the third time the journal has been enlarged in the two years of its existence and we trust our subscribers will show their appreciation of the fact by trying to induce others to subscribe. More pages will be added as soon as our subscription list warrants it.

* * *

It is interesting to note that a majority of our subscribers have complete files of this magazine, those who did not begin at the beginning having ordered them later. Back numbers of a daily paper are of comparatively small value, for its contents become stale in a very short time; but with THE AMERICAN BOTANIST time only increases its value. Such articles as "The Origin of Species by Muta-

tion," "Experiments with the Fringed Gentian," "Plants in Winter," "Climate and Vegetation," "The Advent of Spring" and others are of permanent interest and will bear frequent reading while the three hundred or more notes on a great variety of subjects contain an amount of information about plants that can be obtained nowhere else for the same money. In this connection it may be noted that we now have only about 150 complete files left for sale.

* * *

The part of the editor's garden from which he derives the most pleasure is a seed-bed in an out-of-the-way corner wherein are plantes the seeds which correspondents send to him from time to time, or which he is able to secure by exchange. Watching the seedlings spring up and mature is like botanizing in foreign parts. In many cases the seeds are from plants whose names are well known, but which he has never seen growing. Coaxing them into bloom adds a zest to their study that is missing in botanizing where the flowers grow naturally. The perennials that show promise are later moved into the wild-garden to make the acquaintance of plants from many other parts of the United States—evening primroses from Kansas, columbines from Colorado, galax from North Carolina and so on. At present the first handsome blossoms of *Adopogon montanum* are opening, and earlier in the season the editor had his first sight of the flowers of *Shortia* for both of which he is indebted to Mr. E. C. Robbins of Kawana, N. C. In some sections people might smile at the cultivation of such "weeds" as partridge pea (*Cassia*) iron-weed and pleurisy-root but these are not weeds with us and they get as much care as many a more pretentious species. The iron-weed and pleurisy-root in the editor's garden began life in Kansas and were transported thither together with other plants through the kindness of Dr. C. F. Menninger. Having derived much pleasure from this method of botanizing, the editor recommends it to others. The easiest way to make a start is to select seeds of your

own showy wild-flowers and offer them in exchange for others. A convenient seed packet for this work that can be made in the field as wanted was described and figured in volume III of this journal. The exchange of plants costs more for transportation but is often desirable. In such cases small but vigorous plants should be selected, wrapped in damp moss and mailed in a tin box. The postage on *living* plants is one-half cent an ounce and bulbs, tubers and rhizomes may be sent at the same rate.

* * *

The death of J. W. Withers, owner of *American Gardening*, caused that journal to suspend for a few issues. It has now appeared under new management with the prospect of numerous improvements. Mr. Leonard Barron has been retained in his position as editor.

## BOOKS AND WRITERS.

"The Flower Garden" by Ida D. Bennett, is evidently the work of a practical gardener, though written by a woman; no dabbler in such matters would be able to crowd a book with so many helpful suggestions as she has done. The cultivator of flowers will seldom be disappointed when turning to it for help. This is especially true in reference to numerous minor hints which the ordinary gardening books fail to include. The twenty-four chapters treat of all phases of flower gardening from the location and arrangement of the garden to winter protection and includes such subjects as aquatics, hardy shrubs, care of bulbs and roots during winter, the blooming season of various trees, shrubs and herbs, the common names of flowers, etc. There are about forty illustrations mostly, however, of a kind that do not illustrate. Amateurs will find the book a very desirable addition to their stock. (New York, McClure, Phillips & Co., $2.00 net.)

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